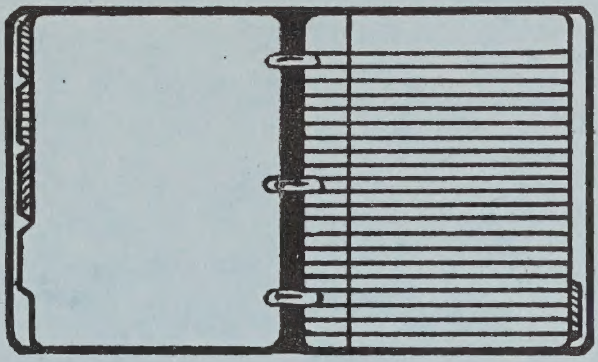
Bill Mayhew

Journal

LOOSE LEAF INDEX

DURABLE INDEX DIVIDERS, SUITABLE FOR SCHOOL OR COMMERCIAL USE



IDEAL FOR CLASSIFYING OR SEPARATING STUDIES, VARIOUS SUBJECTS OR MISCELLANEOUS DATA.

CLASS SCHEDULE

PERIOD TIME	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH	EIGHTH
COURSE **MONDAY**								
INSTRUCTOR								
COURSE **TUESDAY**								
INSTRUCTOR								
COURSE **WEDNESDAY**								
INSTRUCTOR								
COURSE **THURSDAY**								
INSTRUCTOR								
COURSE **FRIDAY**								
INSTRUCTOR								
COURSE **SATURDAY**								
INSTRUCTOR								

NAME ______________________________

SCHOOL ____________________ CLASS ____________

HOME ADDRESS ______________________________

CITY ____________________ TELEPHONE ____________

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Mar. 1 Strawberry Canyon, U.C. campus, Alameda Co., Calif.

The day was completely overcast, with occasional fits of rain. The birds were rather active early in the morning, but seemed to move about less toward noon. The route taken was from the north end of the stadium up Big C hill toward the cyclotron, then south along a paved road past the experimental dairy barns, and back to the starting place. Oregon Juncos seemed to predominate in the numbers seen. Most of the birds encountered sang at least occasionally. One nest was found, that of an Anna's Hummingbird. The birds seen on this morning's trip were: Oregon Junco, Black Phoebe, Say's Phoebe, Brown Towhee, Spotted Towhee, Robin, Sharp-shinned Hawk, California Jay, Ruby-crowned Kinglet, Allen's Hummingbird, Anna's Hummingbird, Song Sparrow, Hermit Thrush, Red-tailed Hawk, California Purple Finch, Golden-crowned Sparrow, White-crowned Sparrow, Bush-tit, & Sparrow Hawk for a total of 19 species. The songs of the Wren-tit, Pine Siskin, House Finch & Red-shafted Flicker were also identified by the group.

This afternoon another trip was made up Strawberry Canyon, this time along the southern side. The weather was still overcast with occasional showers. Birds didn't seem to be as numerous as in the morning, although several species were observed. By 4 P.M. there

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Mar. 1 Strawberry Canyon, U.C. campus, Alameda Co., Calif.
was almost no sign of bird activity. During the afternoon the following birds were observed: 1 Red-shafted Flicker, 2 Hermit Thrush, 5 Fox Sparrows, 2 Robins, 2 Juncos, 5 Wren-tits, 4 Allen's Hummingbirds, 4 Ruby-crowned Kinglets, 2 Brown Towhee, 2 Orange-crowned Warblers, 1 Red-tailed Hawk, 3 Anna's Hummingbirds, 1 Sharp-shinned Hawk, about 20 Bush-tits, and about 30 Pine Siskins for a total of 15 species in the afternoon, 24 different species for the day.

Mar. 8 Strawberry Canyon, U.C. campus, Alameda Co., Calif.
Today was overcast with occasional rain. Our route was from the north end of the stadium east along the northern side of the canyon, then back along the southern side of the canyon & the stadium. The birds seen today were: Bush-tit, Junco, Song Sparrow, Orange-crowned Warbler, Calif. Jay, Red-tailed Hawk, Hutton Vireo, Black Phoebe, Sparrow Hawk, Pine Siskin, Anna's Hummingbird, Allen's Hummingbird, Hermit Thrush, Ruby-crowned Kinglet, Purple Finch, Brown Towhee, Spotted Towhee. The songs of the Wren-tit, Bewick Wren, Stellar's Jay, Hairy Woodpecker were also heard. The type of habitats encountered today were chaparral, coniferous forest, and pond.

Mar. 9 Crows Landing Highway, 9 miles south of Modesto, Stanislaus Co., Calif.
My observations were made from the living room windows this morning. The day was overcast with a rather strong south-east wind blowing. Birds didn't

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Mar. 9 Crows Landing Highway, 9 miles south of Modesto, Stanislaus Co., Calif.
seem to be very active at this time, although those that were seen were rather busy. The species seen during this period of observation were: Sparrow Hawk, Crow, Brewer's Blackbird, Red-winged Blackbird, English Sparrow, House Finch, Mockingbird, Audubon's Warbler, and Red-shafted Flicker.

Mar. 15 Lake Merritt, Oakland, Alameda Co., Calif.
The day was warm and sunny with no breeze to speak of. Except for the grebes, Coot, Mallards, Baldpates + Terns that were feeding, the remainder of the birds just seemed to swim around or simply rest on the water or the shore. The Mallards fed near the edge of the lake, the Coots did also, the Grebes fed at a little distance from the shore, the Baldpates fed on the lawn a short distance from the shore, and the Terns fed from the air, occasionally diving close to the surface of the water. The birds seen at Lake Merritt today were: Coot, Mallard, Mute Swan, Baldpate, Wood-duck, Lesser Scaup, Pintail, Ruddy Duck, Canvas-back, Pied-billed Grebe, Western Grebe, Eared Grebe, Forster's Tern, Ring-billed Gull, Brewer's Blackbird, Canada Goose, Lesser Canada Goose, Cackling Goose, White-fronted Goose, Lesser Snow Goose, American Egret, Black-crowned Night Heron, Double-crested Cormorant, American Golden-eye, California Gull, House Finch, English Sparrow, Western Robin, and Red-shafted Flicker, for a total

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March 15 | Lake Merritt, Oakland, Alameda Co., Calif.

of 29 species in all. On the trip home from Oakland to Modesto, Stanislaus County, California, the following species were seen: Cliff Swallow, Florida Gallinule, Red-winged Blackbird, Western Meadowlark, Great Blue Heron, California Shrike, and Western Mockingbird, bringing the total for the day to 36 species.

March 29 | Strawberry canyon, U.C. campus, Alameda Co., Calif.

At 8:15 A.M. we passed through grassland habitat, and then through a chaparral habitat, where Perognathus is usually found associated with Calif. Sage (Artemesia). Then we passed into a border woodland habitat, where white-footed mice + wood rats may be found, as well as skunks + weasels. On a return to the grassland habitat, a series of mounds, denoting the workings of a pocket gopher, were found. A white-footed mouse nest (?) was found about 6' above the ground at the tip of a branch of a pine tree. One acorn was found in the nest, and since the nearest live oak was about 75 yards away, it had been carried quite a distance. The nest was composed of pine needles, various grasses + some horse-hair. Our route was from the north end of the stadium up the hill above the stadium to the road leading to the cyclotron, then south along the road to Strawberry pool, + back to the stadium on the south side of the canyon.

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March 29 Strawberry Canyon, U.C. campus, Alameda Co., Calif.
The weather was rather disagreeable, as it sprinkled most of the morning. In all, we went through grassland, dry chaparral, wet chaparral, woodland with no understory, woodland with dense understory, and an introduced conifer habitat.

April 12 Strawberry canyon, U.C. campus, Alameda Co., Calif.
Due to the high wind blowing down through the canyon, looking for birds didn't meet with too much success. The wind distorted many of the songs, so that it was difficult to accurately identify the species encountered by their songs. The majority of the birds that were encountered were found in the bottom of the canyon where the wind wasn't so strong. One vireo nest & one nest of an unidentified species were seen during the morning. Our route was along the southern side of the canyon (Strawberry), around the eastern end and back on the northern side of the canyon. The species seen were: Purple Finch, Bush-tit, Junco, Turkey Vulture, Green-backed Goldfinch, Red-tailed Hawk, Orange-crowned Warbler, Song Sparrow, Brown Towhee, & Sharp-shinned Hawk. The additional species heard were: Bewick Wren, Wren-tit, & Pileolated Warbler.

April 19 Wildcat canyon, Contra Costa Co., Calif.
Our route today was down the hill from the reservoir to Jewel Lake in the canyon, then back to the reservoir. The weather was clear & warm. Birds were in abundance all

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April 19 Wildcat Canyon, Contra Costa Co., Calif.
morning. We spent the time learning more bird songs. The species seen were: Olive-sided Flycatcher, Song Sparrow, Orange-crowned Warbler, Spotted Towhee, Pine Siskin, Allen's Hummingbird, Purple Finch, California Jay, Oregon Junco, Bush-tit, Pileolated Warbler, Sharp-shinned Hawk, Black-headed Grosbeak, Titmouse, Western Flycatcher, Steller's Jay, Red-winged Blackbird, Ring-necked Duck, Black Phoebe, Coot, and American Goldfinch. In addition to these, the songs of the Quail, Wren-tit, & Warbling Vireo were also heard.

April 26 Bay Farm Island, Alameda Co., Calif.
The trip today began at 5:15 A.M. at the bridge to the island. After about an hour of individual observation, the class organized and began studying the species near the bridge. Then we continued east along the shore of the bay and around an arm of the bay. The tide had just started to drop when we arrived, and by 9:30 A.M. was about a quarter of a mile from the high tide line. During the trip, we observed in several habitats: sandy beach, mud-flats, marsh land (Salicornia) and grassland. For the major part of the morning, nearly all the shorebirds were feeding. During the trip, the following species were seen: Meadowlark, Great Blue Heron, Semi-palmated Plover, Dowitcher, Red-backed Sandpiper, Killdeer, English Sparrow, Marbled Godwit, Mallard,

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April 26 Bay Farm Island, Alameda Co., Calif.

Western Sandpiper, Western Willet, Brown Pelican, Western Gull, California Gull, Avocet, Bonaparte's Gull, Hudsonian Curlew, Brewer's Blackbird, Robin, Sanderling, Knot, Barn Swallow, Forster's Tern, Caspian Tern, Ring-billed Gull, Black-bellied Plover, Black Turnstone, Ruddy Turnstone, Pintail, Cliff Swallow, California Clapper Rail, Scaup, Ruddy Duck, Greater Yellow-legs, Snowy Plover, House Finch, and Sparrow Hawk.

The most abundant species was the Western Sandpiper, the Dowitchers being next most abundant. Avocets, Marbled Godwits, Hudsonian Curlews, and Semi-palmated Plover were all fairly common. The rest of the species ranged down to individual observations of single specimens.

May 3 Strawberry Canyon, U.C. campus, Alameda Co., Calif.

As I had to leave the field trip early to take an examination, I didn't accomplish very much in the way of bird study. Our trip was from the north end of the stadium to Strawberry Pool. The morning was quiet and bright. The only real excitement of the morning was watching a cat make an unsuccessful attempt to catch any one of six quail that were the members of a flock. The nests of a Black-headed Grosbeak and a Brown Towhee were found, but were inaccessable to all members of the class, due to their

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May 3 Strawberry Canyon, U.C. campus, Alameda Co., Calif. location in trees in the middle of poison oak patches. However, we were able to get close to a bush-tits' nest that was also found. The following species were seen today: Valley Quail, Black Phoebe, Lazuli Bunting, Bush-tit, Brown Towhee, Song Sparrow, Anna's Hummingbird, Orange-crowned Warbler, Black-headed Grosbeak, Warbling Vireo, and Purple Finch. In addition, the songs of the following were also heard: Hutton Vireo, Swainson Thrush, Spotted Towhee, Pileolated Warbler, Red-breasted Nuthatch, & Wren-tit.

May 3 ~~Trip~~ from Berkeley, Alameda Co. to Modesto, Stanislaus Co., Calif. This afternoon I travelled from Berkeley to my home near ~~Modesto~~ by auto. This route passes through several habitats: grassland, woodland, cultivated land, fresh-water marsh, river, and open grazing land. On this trip, the following species were observed: Meadowlark, Brewer's Blackbird, Sparrow Hawk, Western Kingbird, & California Shrike in the plains and grassland areas; American Bittern, Black Tern, Black-necked Stilt & Red-winged Blackbird near fresh-water marsh, Cliff Swallows near the river; Bullock's Oriole in the tree-covered area; English Sparrows, House Finches, & Robins were seen in the cultivated areas.

May 10 Wildcat canyon, Contra Costa Co., Calif.
The field trip today began at the tennis court at Indian camp in Wildcat canyon. Our group then proceeded to a little stream just south of the ~~Wildcat~~ Tilden Park golf course club house, where we looked for amphibians. Most of the morning was spent turning over rocks + branches near the stream or exploring in the pools formed by the stream. The day was warm and sunny. The amphibians found were: Triturus granulosus, Hyla regilla, Batrachoseps attenuatus, Ensatina eschscholtzii, Aneides lugubris, + Rana aurora. The reptiles found on the grassy hillside that we explored were: Pituophis catenifer (gopher snake) + Sceloporus occidentalis (fence lizard).

May 16 U.C. campus, Alameda Co., Calif.
All morning, + all the afternoon that I didn't have class, I sat under a conifer just south of Hilgard Hall + watched a robin's nest.

May 21 I spent all the afternoon, from 3:30 P.M. to 7:00 P.M. observing the actions of a pair of parent Robins feed their young. The weather was warm + clear until about 5:45 P.M. when a high fog blanketed the area, causing quite a drop in temperature. It became even cooler as soon as the sun went down behind the Golden Gate at little later.

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May 23 U.C. campus, Alameda Co., Calif.
I spent from 5:30 A.M. to 9:30 A.M. watching a Robin's nest just south of LSB. The weather was cool & the sky was completely overcast when I began my observations. At 7:10 A.M. the sun broke through the overcast, & from then on the weather warmed up considerably. Other species that came into view while I was observing were: Swainson's Thrush, Brown Towhee, Spotted Towhee, Purple Finch, Cliff Swallow, Bush-tit, Lawrence Goldfinch, Brewer's Blackbird, & Song Sparrow.

May 28 I spent from 2:45 P.M. to 5:15 P.M. making observations on the nest in the Cedrus deodara tree south of Hilgard Hall. The weather was clear & warm, with almost no trace of a wind. The only other birds seen while watching the nest were: Brown Towhee, Bush-tit, Song Sparrow & Brewer's Blackbird.

May 30 Crows Landing Highway, 9 miles south of Modesto, Stanislaus Co., Calif.
I started a trip from this point at 9 A.M. and travelled to Leland Creek, Tuolumne county, Calif. On this trip I went from Lower Sonoran to Transition zones, Leland Creek being about 6000 feet high on the west slope of the Sierras. On this trip I saw in the Lower Sonoran zone: in open country, Western Mourning Dove, Cliff Swallow, Barn Swallow, Meadowlark, Black-necked Stilt, Bullock's Oriole, English Sparrow, House Finch, Western Kingbird, Brewer's Blackbird,

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May 30 Crows Landing Highway, 9 miles south of Modesto, Stanislaus Co., Calif.
Red-winged Blackbird, Western Robin, Turkey Vulture, and Western Bluebird. In the Upper Sonoran zone, the Western Lark Sparrow was seen in open grassy country, and the California Woodpecker was seen in the oak forests. In the Transition zone, in the conifer forest, the Western Chipping Sparrow, Steller's Jay, and Sierra Junco were seen. The weather was cloudy all morning, with occasional showers in the Transition zone.

June 1 Leland Meadow, Tuolumne Co., Calif.
At 11:30 A.M. I took a hike from the cabin on Leland Creek up the hills to Leland meadow. In the conifers on the way to the meadow I saw Steller's Jay, Sierra Junco, and Western Chipping Sparrow. In the meadow itself, I saw Brewer's Blackbird, Western Robin, and Olive-sided Flycatcher. One Robin's nest was found about 10 feet above the ground on the east side of a conifer, but there were no eggs in it yet. It looked as though it had just been completed.

June 7 Strawberry + Woollsey Canyons, Alameda Co., Calif.
Our route today was from the north end of stadium through a corner of Strawberry canyon behind Bowles Hall, north to Woollsey canyon, then back east of the cyclotron to the north side of Strawberry canyon, then down the canyon to the stadium again.

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June 7

Strawberry + Woollsey Canyons, Alameda Co., Calif.
The sky was overcast all morning, but it didn't rain except for an occasional drizzle. A slight south-east wind was blowing most of the morning. Our route led us through eucalyptus groves, in which we saw Great Horned Owls, Steller's Jay, Oregon Junco, Olive-sided Flycatcher, and Brown Towhee. Western Flycatcher, California Jay, Purple Finch, House Finch, Mourning Dove, Bush-tit, Spotted Towhee, Lazuli Bunting, Song Sparrow, Arkansas Goldfinch, and American Goldfinch were seen in a live oak surrounding. Red Shafted Flicker + House Wren were seen in the open — the House Wrens were seen in a wire fence. California Quail were seen on hillsides that were relatively open. This made a total of 19 species seen during the morning. Also heard during the morning were: Pine Siskin, Plain Titmouse, Warbling Vireo, Orange-crowned Warbler, Bewick Wren, Swainson Thrush, and Western Robin, for a total of 7 other species encountered during the morning. On the whole, the birds were all singing rather commonly. The cloudy weather didn't seem to quiet them at all. In addition to birds, 2 Black-tailed Jackrabbits were seen east of the cyclotron.

1948

March 13

8 miles west of Gridley, Butte Co., Calif.

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March 13

8 miles west of Gridley, Butte Co., Calif.
Today noon saw our Zoology 145 class leave the Berkeley campus for Gray Lodge Refuge in Butte Co. After a short walk around the duck ponds about sun-down, John Cowan, Assistant Game Manager in charge of the refuge talked to us, giving us the following information: The refuge consists of 2600 acres, 1600 acres of which are under water. There is a 50-50 ratio of open water + tules. They have planted water grass, rice, + wheat to help feed the waterfowl. Mallards + Cinnamon Teal are the principal visitors on the refuge. It is estimated that 2,000,000 ducks occur on the refuge at one time occasionally. Banding waterfowl is going to be one of their larger projects this spring.

Then Howard Twining, Assistant Game Biologist in charge of the Pheasant project for California Fish + Game told us the following about pheasants: The pheasant population hit its peak about 1943. By 1945 the population was on the down-grade. A man was assigned to find out whether poisoning blackbirds had done anything to the pheasant population. It was found that pheasants couldn't be killed with the poison bait that was being used for blackbirds under normal

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March 13

8 miles west of Gridley, Butte Co., Calif.

conditions. There are 8 factors that may possibly cause pheasant shortage: (1) mowing hayfields, (2) cars kill birds, (3) poisoning, (4) predators, (5) poachers, (6) plowing rice fields at nesting time, (7) extreme climatic conditions at critical period of life history of young chicks, (8) fertility.

The peak of nesting in that area is at the time of the first mowing of alfalfa. The second mowing catches a few second nestings + kills some hens on the nest. The third mowing catches half-grown chicks. The fourth + fifth mowings are unimportant. As an example of the damage done, on 53 acres, 45 nests + 112 birds were found destroyed. There is also a high mortality rate in the only mowing of vetch. The flushing bar is thought to save up to 50% of the birds. However, it had no effect on the general population in the Chico area.

Cars were found to have killed 385 pheasants on a 10 mile stretch during the months of July, August, + September. This stretch had rice on one side of the road, wheat stubble on the other.

As stated before, the birds wouldn't eat enough of the poison grain to kill them.

Of 171 nests found, 34 were destroyed by coon, 13 by skunk, 7 by house cats, 2 by

March 13 8 miles west of Gridley, Butte Co., Calif.

crows. Of 31 other nests, 7 were "dump" nests, 0 abandoned, 3 hatched, 21 destroyed by coons or skunks. Of 65 other nests, 22 were "dump" nests, 4 abandoned, 17 hatched, 12 destroyed. House cats seem to do more damage toward the end of nesting season. The loss of game farm birds to house cats is high.

Poaching cuts the pheasant population somewhat, but it has dropped off lately.

Cold in the east + mid-west causes damage to young chicks, but it is thought that dryness causes the damage in California.

It has been found that hens lay 30-40 eggs per year, but the average clutch size is 10.8 eggs. The rest of the eggs are deposited in "dump" nests. The fertility of the eggs in "dump" nests average 94, that in good nests 98, that on game farms 92.

From May 1 to the end of June, these men make brood counts. This is done by driving down the road in a car in early morning + late evening.

About July 1, experimental plantings of game farm birds is begun.

About October 1, they prepare for the hunting season. (The age of the birds can be determined by the presence of a bursa in the dorsal wall of the cloaca in young birds, minute or absent bursa in old birds.) Hunters took 78% of the total birds killed

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March 13 8 miles west of Gridley, Butte Co., Calif.
on the first day of a 10 day period in the checked areas. 49.3% of the hunters got birds the first day, then the number dropped off. 85-90% of the birds killed are birds of the year.

About January 1, bird census begins. This is done by observation from a car, or on foot, or by airplane, or by driving the birds, or by counting cock crows. The foot census is the best so far.

March 14 This morning we made a tour of the refuge, partly by car, the rest on foot. There was intermittant rain and a strong south-east wind all day. Besides observing the waterfowl present on the refuge, we saw a freshly killed Lesser Snow Goose that was presumably killed by a hawk. Shortly after noon we traveled to the Bigelow ranch, where we made a practice pheasant drive through a field whose predominant vegetation was last year's stand of star thistle. Quite a number of pheasants were scared up — predominantly hens. We then went to the Sartain ranch, where we looked over some typical pheasant habitat in rice fields. As soon as we returned to the cars from this trip through the rice field, we started back to Berkeley. During the day, the following species of birds were observed — both in

March 14 8 miles west of Gridley, Butte Co., Calif. the field + from the car: Junco, White-crowned Sparrow, Canadian Goose, Cackling Goose, Coot, Baldpate, White Pelican, Brewer's Blackbird, Red-winged Blackbird, Violet-green Swallow, Killdeer, American Bittern, Snow Goose, Robin, Mallard, Dowitcher, Red-backed Sandpiper, Wilson Snipe, Ring-necked Pheasant, Whistling Swan, Mourning Dove, Cinnamon Teal, Green-winged Teal, White-fronted Goose, Marsh Wren, Meadowlark, American Egret, Black-crowned Night Heron, Gadwall, Western Gull, Ruddy Duck, Shoveller Duck, Turkey Vulture, Great Blue Heron, Marsh Hawk, California Shrike, Red-shafted Flicker, Crow, Sparrow Hawk, Black Phoebe, Magpie, Song Sparrow, Lark Sparrow, Pied-billed Grebe, Western Bluebird, Mockingbird.

April 3 Strawberry Canyon, U.C. campus, Alameda Co., Calif. This morning Carl Hubbs + I made a survey of birds in the canyon. He was working with hawks + I was making a census of the various members of the Fringillidae found in the different habitats in the canyon. We went through the grasslands + chaparral on the north slope of the canyon, through the eucalyptus grove east of the cyclotron, through the Botanical Gardens, + back to the stadium through the oak-laurel association on the south slope of the canyon. The weather was clear, but cool,

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April 3 Strawberry Canyon, U.C. campus, Alameda Co., Calif. with a brisk westerly breeze. The species of birds seen on this trip were; American Goldfinch, Spotted Towhee, Brown Towhee, Song Sparrow, White-crowned Sparrow, Fox Sparrow, Golden-crowned Sparrow, Pine Siskin, Junco, Purple Finch, House Finch, Sparrow Hawk, California Thrasher, Orange-crowned Warbler, Bush-tit, Red-tailed Hawk, Sharp-shinned Hawk, California Jay, Steller's Jay, Allen's Hummingbird, Anna's Hummingbird, Ruby-crowned Kinglet, Wren-tit, Bewick's Wren, Varied Thrush, Red-breasted Nuthatch,

April 18 Jawbone Ridge, Stanislaus Nat'l. Forest, Toulumne Co., Calif. Our group arrived shortly before sun-down at the camp-site near Jawbone Ranger Station. After eating, the men in charge of the deer survey, Randall McCain, Thayne Raine, + Bill Longhurst, told us what they had accomplished so far, and some ideas as to what they hoped to accomplish in the future.

April 18 Jawbone Ridge, Stanislaus Nat'l. Forest, Toulumne Co., Calif. This morning we were taken up to the top of the ridge where the deer traps were located. One old doe that hadn't been caught before, + a young doe that had been caught 3 times previously were in the traps. After weighing + measuring them, counting parasites on

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April 18 Jawbone Ridge, Stanislaus Nat'l. Forest, Toulumne Co, Calif.
them, tagging, clipping the ears & tail of the old doe, they were turned loose. Several hundred deer were seen in the course of the day. One specimen of Aneides lugubris was collected, as well as several specimens of Ensatina eschscholtzii. These were all found under logs. Two lizards (Sceloporus) were found under a rock. About 25 bats of the genus Myotis were collected from the wall of a cave. The birds seen during the trip were: Hairy Woodpecker, California Woodpecker, Western Lark Sparrow, California Jay, Steller's Jay, Junco, Robin, Great Horned Owl, Purple Finch, Bald Eagle, Black Phoebe, Meadowlark, Brewer's Blackbird, Red-winged Blackbird, Turkey Vulture, Red-tailed Hawk, Wren-tit, Bush-tit, Red-shafted Flicker, Chipping Sparrow, Mountain Quail, Violet-green Swallow, Sharp-shinned Hawk, Killdeer, White-crowned Sparrow, Golden-crowned Sparrow.

1949
May 7 Conway Ranch, 2 miles east of Woodland, Yolo Co, Calif.
The weather today was warm, with very few clouds, but the wind was blowing quite hard from the north. Although the greater part of the time was spent in looking for Mallards, a number of

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Conway Ranch, 2 miles east of Woodland, Yolo Co, Calif.
Other species were seen also. Those seen were: Black-necked Stilt, Brewer's Blackbird, Red-winged Blackbird, Tri-colored Redwing, Killdeer, Mallard, Coot, Florida Gallinule, Snow Goose, Meadowlark, Black Tern, Marsh Hawk, Barn Swallow, Cliff Swallow, Pheasant, Mourning Dove, Yellow-headed Blackbird, Great Blue Heron, Pintail, White-fronted Goose, Sparrow Hawk, Burrowing Owl, Avocet, Bittern, Black-crowned Night Heron, Double-crested Cormorant, American Egret, Crow, Forster's Tern, Long-billed Curlew, Green Heron, Calif. Gull, Least Sandpiper, Western Sandpiper, Red-backed Sandpiper, Long-billed Dowitcher, Cinnamon Teal, Bullock's Oriole, Calif. Shrike, Ash-throated Flycatcher, Ruddy Duck. Five pair of Cinnamon Teal were seen in the drainage ditch at the south end of the ranch.

May 14 Today the weather was overcast, with a fair breeze blowing in the latter part of the afternoon. Birds were plentiful, however. In addition to the species seen last week, the following were seen today: Song Sparrow, White Pelican, Whistling Swan, Lesser Scaup, English Sparrow, Calif. Quail. 2 pairs of Pintail, 1 pair of Lesser Scaup, + 1 pair of Cinnamon Teal were seen today.

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May 22

Conway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
Most of today was spent driving around the ranch to give Earl Hubbs a chance to shoot some cats for his research problem. The weather was warm, the sky cloudless, + no wind. A number of Mallards were seen, but not too many as pairs. In most cases, the birds seen were a number of drakes together. In addition to the birds seen previously on the ranch, the following were seen today: Red-shafted Flicker, House Finch, Kingbird, Snowy Egret + Screech Owl.

June 15

Today I rode a grain harvester while it was harvesting barley in order to see how many pheasant + Mallard nests are destroyed by the harvest. We covered 31 acres today, + found 5 Mallard nests + pheasant nests. Of this number, 3 were destroyed by the harvester, the remainder were merely uncovered. A number of ♀ Mallards were seen flying low over the stubble, apparently searching for their nests. Occasionally they would drop into the stubble + walk around as though looking for something. Rarely was a ♂ Mallard seen. (30 Mallard eggs, 0 pheasant eggs)

June 18

We covered **10** more acres of barley today with the harvester (a "side header"). 2 Mallard nests were found, with a total of 16 eggs. One of the nests was directly destroyed by the harvester.

June 21 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
We covered 32 acres of barley with the harvester today. A total of 4 Mallard nests were found today, none of which were damaged by the harvester. There was a total of 25 eggs in the Mallard nests found today.

June 23 Today the harvester covered another 32 acres. I found 4 Mallard nests + 2 pheasant nests, with a total of 20 Mallard eggs + 18 pheasant eggs. None of the nests were destroyed by the harvester.

June 25 Today I went around to see what had occurred at the nests uncovered by the harvester. Beef cattle are now pasturing on the grain stubble, & they had trampled 1 nest. The remainder that I checked today had been deserted, either because the ♀ couldn't find the nest again, because there was not sufficient cover around the nest, or because the disturbance created by the harvester had frightened them all away.

July 9 Today John Earl & I covered most of the ranch looking for Mallards. However, while he was with me, we found only 1, a ♀. After he left I found 2 more ♀ + 1 ♂ — 1 of the ♀ was flushed from a nest. Neither of us can explain the apparent extreme scarcity of these ducks at this time.

July 10 Today I found a Pied-billed Grebe nest in the permanent ditch about ½ mile west of the ranch headquarters. The

July 10 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif. nest contained 4 young that I would judge to be less than 48 hrs. old, & 2 eggs. The ♀ was on the nest the first time I saw it, but she was gone when I returned.

About ½ mile north of the pumping station at the south end of the ranch, in the mud flats just east of the main canal, I saw a rather large flock of Black-necked stilts & avocets. Interspersed in the flock I could see Marbled Godwits, Long-billed Dowitchers, 2 White-faced Glossy Ibis, a Forster's Tern, & 8 Cinnamon Teal. This is the first time I have seen White-faced Glossy Ibis in this area. This spot is in the middle of section 27. A few moments later, some Greater Yellow-legs & a ♂ Blue-winged Teal arrived. I have seen this "Blue-wing" in the area off & on for the past 12 days.

About a mile farther on, a Western Willet was seen in a group of stilts, avocets, Dowitchers & Greater Yellow-legs.

Aug. 12 Today we made an aerial census of the ducks on the Conaway Ranch. We flew about 105 miles per hour 150 feet above the ground. There was one of us (Wendell Miller & I) taking 1/8 of a mile on each side of the plane as it flew back & forth over the rice fields.

Mayhew
1949

Aug. 12 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
When we had covered all the rice on the ranch, we flew over all sloughs, ditches, etc. that might contain ducks. As we were able to count blackbirds, stilts, shrikes, etc. from this altitude, we don't feel that we missed many ducks. Miller counted 54 Mallard + 28 Cinnamon Teal from his side — I counted 156 Mallard + 15 Cinnamon Teal on my side. This made a total of 210 Mallard + 43 Cinnamon Teal found on the ranch. As there is approximately 5000 acres of rice on the ranch, this would mean about 1 duck for every 19.7 acres, or 1 Mallard for every 23.8 acres.

1950
Feb. 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
Today I drove over the southern half of the ranch to see how many Mallards were in the area by now. We have been having regular May weather for the past 10 days or so, so I wanted to see how this early warm weather affected the bird population. There were large numbers of ducks on several ponds that were formed by the earlier rains. These groups were made of several species — principally Mallard, Pintail, Green-winged Teal, Baldpate, + a few Cinnamon Teal. The species of bird

Feb. 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co. Calif. seen most commonly was the Coot. Some of the Mallards act as though they are already paired, but I was unable to determine if this is actually the case or not. Perhaps some of them arrive here already paired. The greatest number of Mallards, however, are still together in flocks.

The following species were seen on the ranch today — the number following the name signifying the relative abundance on the ranch on this day. #1 = abundant, 200 birds or over; #2 = common, 50-200 birds; #3 = scarce, 5-50 birds; #4 = rare, 1-5 birds:

Brewer's Blackbird - 3	Crow - 3
Red-winged Blackbird - 1	Calif. Gull - 3
Killdeer - 3	Cinnamon Teal - 3
Mallard - 1	Calif. Shrike - 4
Coot - 1	Ruddy Duck - 4
Meadowlark - 2	Snowy Egret - 4
Marsh Hawk - 4	Flicker - 4
Pheasant - 3	Greater Yellow-legs - 4
Mourning Dove - 3	Marsh Wren - 3
Great Blue Heron - 3	Savannah Sparrow - 1
Pintail - 2	Gambel's Sparrow - 2
Sparrow Hawk - 3	Pipit - 2
Avocet - 3	Red-tailed Hawk - 3
Black-cr. Night Heron - 4	Pied-billed Grebe - 4
American Egret - 3	Green-winged Teal - 2

Feb. 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

Baldpate – 3
Audubon's Warbler – 4
Canvasback – 4
American Merganser – 4
Mockingbird – 4

This made a total of 35 species seen today.

March 6 I spent this afternoon on the southern end of the ranch, looking primarily for evidence of territories being established by the Mallard population. The sky was partly overcast with occasional sprinkles + a strong north wind was blowing. Although a fair number of Mallards were seen, no birds were seen with definite territories as yet. A fairly large number appeared to be paired already, however.

An enormous flock of Canadian, Hutchins + Cackling Geese was seen near some ponds formed from rain water in low spots. These ponds are in the middle of former grain fields, so there is no cover whatever for more than 2 miles in any direction. As a result, it is awfully hard to approach them too closely. I would judge there were over 5,000 geese in this one flock that I saw.

The birds seen, with their relative abundance, on the ranch today, were as follows:

American Pipit – 3
House Finch – 3

March 6 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

Greater Yellow-legs - 3	Killdeer - 3
Red-winged Blackbird - 1	Pintail - 3
Savannah Sparrow - 1	Belted Kingfisher - 4
Mallard - 2	Crow - 3
Coot - 1	Ruddy Duck - 4
Marsh Hawk - 3	Pied-billed Grebe - 4
Calif. Gull - 3	Canvasback - 4
Great Blue Heron - 3	Baldpate - 3
Meadowlark - 3	Green-winged Teal - 4
Marsh Wren - 4	Spoonbill - 4
Pheasant - 3	American Merganser - 4
White-crowned Sparrow - 3	Horned Lark - 3
American Egret - 2	White-fronted Goose - 3
Bittern - 4	Canadian Goose - 1
Tree Swallow - 2	Hutchins Goose - 1
Avocet - 2	Cackling Goose - 1
Cinnamon Teal - 3	Whistling Swan - 3

This made a total of 36 species seen today.

April 2 Today was spent primarily counting breeding pairs of mallards on the ranch. The weather was clear & warm, with almost no breeze blowing. The first Black-necked Stilts of the season were seen today. They are still scarce, however. Large numbers of Avocet are now in the large ~~drainy~~ drainage ditch that forms the south boundary of the ranch. Quite a few Shoveller are still present. The numbers of both Cliff & Barn Swallows is fairly large. The birds seen today were:

April 2 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

Greater Yellow-legs — 4
Red-winged Blackbird — 1
House Finch — 4
Pipit — 3
Savannah Sparrow — 1
Mallard — 2
Coot — 1
Marsh Hawk — 3
Great Blue Heron — 2
Meadowlark — 2
Crow — 4
Pied-billed Grebe — 4
Green-winged Teal — 4
Cliff Swallow — 2
Barn Swallow — 3
Black-necked Stilt — 4
Tri-colored Redwing — 4
Long-billed Dowitcher — 3
Florida Gallinule — 4
Calif. Quail — 4
Marsh Wren — 4
Pheasant — 2
White-crowned Sparrow — 2
American Egret — 3
Snowy Egret — 4
Bittern — 4
Avocet — 1
Cinnamon Teal — 3
Killdeer — 3
Pintail — 3
Canvasback — 4
Shoveller — 3
Horned Lark — 4
Brewer's Blackbird — 3
Yellow-headed Blackbird — 2
White Pelican — 4
Farallon Cormorant — 4
Barn Owl — 4
Mourning Dove — 3
Red-shafted Flicker — 4

This makes a total of 40 species seen today.

April 4 Today was spent counting the breeding pairs of Mallards on the north & east portions of the ranch. The weather was clear with just a slight breeze. I saw the first pair of Wood Ducks I've ever seen in the wild. They were on a pond in the willows along the Yolo by-pass, at the edge of Swanson's.

April 4 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
The following birds were seen today:

Greater Yellow-legs — 3	Mallard — 2
Red-winged Blackbird — 1	Coot — 2
Pipit — 4	Marsh Hawk — 3
Savannah Sparrow — 2	Calif. Gull — 4
Meadowlark — 2	Pheasant — 2
Marsh Wren — 3	American Egret — 3
White-crowned Sparrow — 2	Cinnamon Teal — 3
Bittern — 4	Killdeer — 3
Tree Swallow — 3	Pintail — 4
Avocet — 1	Crow — 2
Pied-billed Grebe — 4	Brewer's Blackbird — 3
Horned Lark — 3	Turkey Vulture — 4
Cliff Swallow — 2	Sparrow Hawk — 4
Great Blue Heron — 2	White Pelican — 2
Red-tailed Hawk — 4	Barn Swallow — 3
Song Sparrow — 3	Farallon Cormorant — 4
Black-necked Stilt — 4	Mourning Dove — 3
California Jay — 4	Spotted Towhee — 4
Yellow-billed Magpie — 4	Fox Sparrow — 4
Long-billed Curlew — 4	Wood Duck — 4
Black Phoebe — 4	Least Sandpiper — 3
Red-shafted Flicker — 3	Calif. Shrike — 4

This makes a total of 44 species of birds seen today.

April 10 This evening (5 P.M.) I covered the ditches on the extreme S.E. corner of the ranch looking for the territories of breeding pairs of Mallards. These

Mayhew
1950

April 10 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif. birds were quite scarce in that region, as I found only 4 pairs before sundown. The weather was warm & clear with no sign of a breeze. The other birds seen this evening are:

Red-winged Blackbird	Great Blue Heron
American Pipit	Meadowlark
Savannah Sparrow	Pheasant
Mallard	White-crowned Sparrow
Coot	American Egret
Bittern	Avocet
Killdeer	Cinnamon Teal
Pintail	Crow
Canvasback (cripple)	Pied-billed Grebe
Green-winged Teal (cripples)	Spoonbill
Brewer's Blackbird	Song Sparrow
Mourning Dove	

This makes a total of 23 species seen this evening.

April 22 I made a tour of the ranch this morning to see if the Mallards had started to nest yet. About 98% of the birds seen were loafing in pairs. One group of 3 ♂ together, & 2 groups of 2 ♂ together were seen. Apparently nesting has not begun, at least for the vast majority. I was surprised at the small number of Black-necked Stilts & Avocets that were seen. The numbers of Avocet have dropped off considerably in the past

April 22 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
three weeks. The Stilts have not as yet anywhere near approached the numbers that were present last year. I saw no evidence of either of these species nesting yet. I spent the afternoon numbering all the new nests of Cliff Swallows under the Poleline Bridge near the western edge of the ranch. There were 111 new nests and 6 old ones that had been repaired.

The birds seen today were:

Cliff Swallow - 1	Barn Swallow - 3
Mallard - 2	Coot - 3
Pintail - 4	Shoveller - 3
Canvasback - 4	Florida Gallinule - 4
Red-tailed Hawk - 4	Red-winged Blackbird - 1
House Finch - 2	Marsh Hawk - 4
Snowy Egret - 4	American Egret - 4
Calif. Gull - 3	Great Blue Heron - 3
Meadowlark - 3	Marsh Wren - 4
Pheasant - 3	Cinnamon Teal - 4
Avocet - 2	Black-necked Stilt - 3
Crow - 4	Pied-billed Grebe - 4
Least Sandpiper - 1	Red-shafted Flicker - 4
Brewer's Blackbird - 2	Farallon Cormorant - 4
Mourning Dove - 4	Greater Yellow-legs - 3

This makes a total of 30 species seen. A number of these birds were seen in fields that are just being flooded for rice.

Mayhew
1950

April 26 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
I spent this morning from 6:30 on primarily looking for Mallard nests. However, most of these birds are still looking for nesting sites. Quite a few were seen flying low over the wheat + barley fields, but I found no nests. I did find one Killdeer nest, though. About 1/2 of the rice land is flooded by now. A large number of Mallards were seen loafing on these flooded areas after 9 A.M. Until that time, most of these birds were seen flying over the grain fields. A great many Long-billed Dowitchers were also seen on this flooded area. The birds seen today were:

Greater Yellow-legs – 4
Red-winged Blackbird – 1
Mallard – 1
Coot – 3
Marsh Hawk – 4
American Egret – 3
Avocet – 3
Crow – 2
Least Sandpiper – 3
Calif. Shrike – 4
Long-billed Curlew – 3
Mourning Dove – 4
White Pelican – 2
Tri-colored Redwing – 4
Barn Swallow – 3
Song Sparrow – 3
Calif. Gull – 3
Great Blue Heron – 3
Meadowlark – 3
Marsh Wren – 4
Pheasant – 2
Bittern – 4
Killdeer – 3
Pied-billed Grebe – 4
Horned Lark – 3
Black-necked Stilt – 4
Calif. Woodpecker – 4
Florida Gallinule – 4
Long-billed Dowitcher – 1
Yellow-headed Blackbird – 4
Brewer's Blackbird – 1
Cliff Swallow – 1

April 26 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
White-fronted Goose - 2 Black Tern - 2
Anthony Green Heron - 4 Forster's Tern - 4
Red-backed Sandpiper - 3 Bullock's Oriole - 4
This makes a total of 38 species seen today. Today was the first time this year that I had seen Black or Forster's Terns, Green Heron, or Red-backed Sandpiper. A flock of 60 White-fronted Geese were seen to pass over, headed north just as I was preparing to return home.

April 27 Very few ducks were seen flying today. The majority of them were seen loafing on the newly flooded fields. I didn't reach the wheat & barley fields until 8:50 A.M., & by that time, apparently, all searching for nesting sites was over for the morning. A flock of 55 White-fronted Geese flew over, going north. Two new killdeer nests were found & marked. About ½ the morning was spent under the poleline bridge watching the cliff swallows. The species seen today are:

Greater Yellow-legs - 3 Mallard - 2
Red-winged Blackbird - 1 Coot - 3
House Finch - 3 Great Blue Heron - 3
Meadowlark - 3 Marsh Wren - 4
American Egret - 3 Pheasant - 3
Bittern - 4 Avocet - 4
Tree Swallow - 4 Killdeer - 3
Calif. Shrike - 4 Crow - 4

Mayhew
1950

April 27 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Pied-billed Grebe - 4
Black Tern - 2
Cliff Swallow - 1
Turkey Vulture - 4
Black-necked Stilt - 3
Long-billed Dowitcher - 1
Least Sandpiper - 3
Ring-billed Gull - 2
Horned Lark - 3
Red-backed Sandpiper - 4
Brewer's Blackbird - 2
Song Sparrow - 4
Barn Swallow - 4
Mourning Dove - 4
White-fronted Goose - 2

This makes a total of 31 species seen today.

April 28 At 6 A.M. I was between wheat & barley fields to see in which fields the most mallards were searching for nesting sites. As I had already believed, the great majority of the birds were seen flying low over the grain (wheat) at the S.E. corner of the grain area (section 17). By 7:30 A.M. most of the ducks had either returned to the flooded rice fields or were loafing on ditch banks that passed through the grain fields. However, a pair would still be seen in the air occasionally when I left the area at 8 A.M. The birds seen this morning were:

Red-winged Blackbird - 1
Mallard - 2
Coot - 2
Meadowlark - 4
American Egret - 3
Killdeer - 3
Pied-billed Grebe - 4
House Finch - 4
Marsh Hawk - 3
Great Blue Heron - 3
Pheasant - 3
Horned Lark - 4
Black Tern - 2
Red-backed Sandpiper - 2

Mayhew
1950

April 28 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Cliff Swallow -1
Brewer's Blackbird -2
Long-billed Dowitcher -1
Florida Gallinule -4
Least Sandpiper -3
Western Sandpiper -3
Canadian Goose -4
Pintail -4
Yellow-headed Blackbird -4
Black-necked Stilt -3
Tri-colored Redwing -2
Mourning Dove -4
Long-billed Curlew -4
Ring-billed Gull -2
Black-bellied Plover -4
Savannah Sparrow -3
Black-crowned Night Heron -4

This makes a total of 31 species seen today. The weather was clear, but a strong wind was blowing out of the north.

May 7 I spent several hours in the middle of the day walking through wheat fields looking for Mallard nests, but I found none. I saw only 3 Mallards flying over the grain fields the entire time. The day was clear, but a strong north wind was blowing. I found the first Avocet nest of the season & also another Killdeer nest. The species of birds seen today were:

Red-winged Blackbird -1
Mallard -3
Coot -3
Pheasant -4
Bittern -4
Cinnamon Teal -3
Anthony Green Heron -4
Red-backed Sandpiper -4
Cliff Swallow -1
Marsh Hawk -4
Great Blue Heron -3
Meadowlark -4
American Egret -4
Avocet -2
Killdeer -3
Forster's Tern -4
Black Tern -2
Brewer's Blackbird -2

May 7 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Song Sparrow — 3 Barn Swallow — 3
Yellow-headed Blackbird — 3 White Pelican — 1
Black-necked Stilt — 2 Tri-colored Redwing — 2
Long-billed Dowitcher — 1 Florida Gallinule — 4
Mourning Dove — 4 Least Sandpiper — 2
Ring-billed Gull — 3 Pintail — 4
Western Sandpiper — 2 Canvasback — 4
Double-crested Cormorant — 4 Shoveller — 4

This made a total of 34 species seen today.

May 20 I spent the morning looking for Mallard nests without success. The afternoon was spent along the main canal & drainage ditch looking for any kind of nest. In one stretch of drainage ditch about 100 yards long, I found 2 coot nests, 2 Marsh Wren nests, 1 Redwing Blackbird nest with 3 young, 4 old Redwing nests, 1 Redwing nest with 4 eggs, 2 Blackbird sp. nests under construction, & 4 Yellow-headed Blackbird nests with eggs in them, for a total of 16 nests. 3 of the Yellowheaded Blackbird nests contained 3 eggs, the 4th contained 2 eggs. The species seen today were,

Brown Towhee — 4 Mallard — 2
English Sparrow — 4 Coot — 3
Gadwall — 4 Marsh Hawk — 4
Sparrow Hawk — 4 Great Blue Heron — 3
Red-winged Blackbird — 1 Meadowlark — 3
House Finch — 3 Marsh Wren — 3

May 20 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Pheasant -3	American Egret -3
Bittern -4	Snowy Egret -4
Avocet -3	Cinnamon Teal -4
Killdeer -3	Horned Lark -4
Forster's Tern -4	Black Tern -3
Cliff Swallow -1	Brewer's Blackbird -2
Turkey Vulture -4	Yellow-headed Blackbird -2
Song Sparrow -4	Black-necked Stilt -3
Barn Swallow -3	Tri-colored Redwing -2
White Pelican -4	Florida Gallinule -4
Mourning Dove -3	Black Phoebe -4
Calif. Shrike -4	Ring-billed Gull -2
Pintail -3	Black-crowned Night Heron -4
Double-crested Cormorant -4	Mockingbird -4
Ruddy Duck -3	Kingbird -4
	Blue-winged Teal -4

This makes a total of 43 species seen today.

May 30 Today I checked all the nests I have marked, then went to find some Mallard nests in the evening, going on the assumption that the ♀ would then be on the nest for the night. However, I found them going to the water when I arrived at the wheat fields, so I found no nests. The birds seen today were:

Red-tailed Hawk -4	Coot -3
Greater Yellow-legs -4	Marsh Hawk -4
Red-winged Blackbird -1	Great Blue Heron -3
House Finch -3	Meadowlark -3
Mallard -3	Marsh Wren -3

Mayhew
1950

May 30 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Pheasant — 4	Bittern — 4
American Egret — 3	Avocet — 3
Snowy Egret — 3	Cinnamon Teal — 4
Crow — 4	Killdeer — 3
Horned Lark — 4	Forster's Tern — 4
Cliff Swallow — 1	Black Tern — 4
Brewer's Blackbird — 3	Barn Swallow — 3
Calif. Jay — 4	Burrowing Owl — 4
Baldpate — 4	Kingbird — 4
Ruddy Duck — 4	Pintail — 4
Double-crested Cormorant — 4	Ring-billed Gull — 2
Black-crowned Night Heron — 3	Mourning Dove — 3
Tri-colored Redwing — 2	Black-necked Stilt — 3
Yellow-headed Blackbird — 2	

This makes a total of 37 species seen today.

May 31 Today I spent several hours walking through wheat fields looking for Mallard nests, but without success. The birds seen today were:

Greater Yellow-legs — 4	Mallard — 3
Red-winged Blackbird — 1	Coot — 4
Marsh Hawk — 4	Great Blue Heron — 3
Meadowlark — 3	Black-crowned Night Heron — 4
American Egret — 3	Snowy Egret — 3
Tree Swallow — 4	Killdeer — 3
Crow — 4	Black Tern — 4
Cliff Swallow — 1	Barn Swallow — 3
Brewer's Blackbird — 4	Turkey Vulture — 4
Yellow-headed Blackbird — 3	Tri-colored Redwing — 3
Black-necked Stilt — 3	Florida Gallinule — 4

Mayhew
1950

May 31 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
Mourning Dove - 4 Ring-billed Gull - 2
Pintail - 4
Kingbird - 4
This makes a total of 26 species seen today.

1952
Mar. 8 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

The class in Zoölogy 134 took a field trip to the ranch today. The sky had scattered clouds, there was a brisk north wind blowing. Most of the area was rather muddy from the recent rains. The major portion of the morning was spent along the drainage ditch that forms the southern boundary of the ranch. The species of birds seen today were:

Tree Swallow - 2	Cinnamon Teal - 3
Marsh Hawk - 3	Bittern - 4
Mallard - 2	Meadowlark - 2
Pintail - 4	Shrike - 4
Coot - 1	Black-cr. Night Heron - 4
Pheasant - 3	American Egret - 3
Marsh Wren - 3	Red-tailed Hawk - 4
Song Sparrow - 3	Florida Gallinule - 4
Red-winged Blackbird - 3	Great Blue Heron - 4
Brewer's Blackbird - 4	Pied-billed Grebe - 4
Killdeer - 4	Anthony Green Heron - 4
Cliff Swallow - 4	Sparrow Hawk - 4
Violet-green Swallow - 4	Black Phoebe - 4
Savannah Sparrow - 1	Western Crow - 4
American Pipit - 3	(29 species today).

Mayhew
1952

Mar. 17 Main drainage ditch, 3 mi. N.E. of Davis, Yolo Co., Calif.

The water was very high in this ditch today, so Bill Salt & I tried to make a Gallinule census along its banks. The birds were too dispersed, however, to get any decent count. Six muskrats were seen in this ditch during the afternoon. The birds seen were:

Gallinule - 3	Marsh Hawk - 4
Coot - 1	Sparrow Hawk - 4
Mallard - 3	Pipit - 2
Canvasback - 3	Savannah Sparrow - 2
Ruddy Duck - 4	Great Blue Heron - 4
Shoveller - 4	American Egret - 4
Killdeer - 4	Meadowlark - 3
Tree Swallow - 4	Brewer's Blackbird - 2

April 4 Road 28, 1¾ mi. east of Winters-Madison Hiway, Yolo Co., Calif.

While driving around to locate Cliff Swallow colonies, a pair of White-tailed Kites were seen above the willows just north of the road. They were flying back & forth, occasionally diving at one another. The Cliff Swallows at the bridge adjacent paid no attention to the kites, nor did the kites appear to take any notice of the swallows.

April 7 Chiles Ranch, 3 mi. N.E. of Davis, Yolo Co., Calif.

This evening Frank Chiles & I went over his ranch looking for 2 or Blue-winged Teal he had seen the day before. We didn't find the Teal, but we did see the

Mayhew
1952

April 7 Chiles Ranch, 3 mi. N.E. of Davis, Yolo Co., Calif.
following species, either on his ranch or in the large drainage ditch just north of his ranch (across the road):

Brewer's Blackbird – 1	Snowy Egret – 4
Yellow-headed Blackbird – 1	American Egret – 4
Red-winged Blackbird – 2	Coot – 1
Barn Swallow – 3	Gallinule – 4
Cliff Swallow – 2	Great Blue Heron – 4
Mallard – 2	Cinnamon Teal – 4
Shoveller – 4	Mourning Dove – 4
Killdeer – 4	Savannah Sparrow – 2
Meadowlark – 3	Pheasant – 3

April 26 Today I wandered over most of the ranch, looking for Mallard nests. I found no nests, but did find 2 broods a couple of weeks old. The weather was overcast, but fairly warm, & there was no wind blowing. The rice growers are just starting to flood this years rice fields. Several species were seen this morning for the first time this year. They were: Avocet, Black-necked Stilt, Black Tern, Cowbird. A little time was spent on the Conaway Ranch, whose south-western corner is just across the large drainage ditch from the north-east corner of the Chiles Ranch. Most of the by-pass area of the Conaway is still under water, which has allowed the Mallards to be scattered over a wide area. There is a great deal of

Mayhew
1952

April 26 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif. fallow land on the southern portion of the ranch, where most of my studies have been carried on. The birds seen today, with their approximate abundance as judged by the numbers of each species that was seen, is as follows:

Meadowlark - 3	Brewer's Blackbird - 3
Savanna Sparrow - 3	Song Sparrow - 3
Barn Swallow - 4	White-crowned Sparrow - 4
Cliff Swallow - 2	Marsh Wren - 2
Mallard - 2	Snowy Egret - 4
Red-winged Blackbird - 2	Great Blue Heron - 4
Killdeer - 3	Least Sandpiper - 3
Greater Yellow-legs - 4	Western Sandpiper - 3
Pheasant - 4	Mourning Dove - 4
Cinnamon Teal - 4	Coot - 3
Long-billed Curlew - 3	Black Gallinule - 4
Avocet - 4	Loggerhead Shrike - 4
Black-necked Stilt - 3	Cowbird - 4
Yellow-headed Blackbird - 3	Marsh Hawk - 4
Tri-colored Blackbird - 4	Pied-billed Grebe - 4
American Egret - 4	Crow - 4
Long-billed Dowitcher - 3	English Sparrow - 4
Black Tern - 3	House Finch - 4

This makes a total of 36 species seen today. 1 Meadowlark, 1 Marsh Wren, & 4 Red-winged Blackbirds were seen carrying nesting material today.

A census was made of the Marsh Wrens in the large drainage ditch at the

Mayhew
1952

April 26 — Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif. southern edge of the ranch. A stretch of ditch 1 mile long was walked, & the number of singing birds was counted. In the 1 mile portion of ditch, 37 birds were counted. This is an average of 142 feet of ditch per bird.

April 29 — Most of the day was spent looking for Mallard nests, but was unsuccessful in that respect. The day was clear, but a fairly strong S.E. breeze was blowing. The birds seen today were:

Turkey Vulture – 4	Mourning Dove – 4
Cliff Swallow – 2	Red-winged Blackbird – 2
Marsh Hawk – 3	Great Blue Heron – 3
Crow – 4	White Pelican – 3
Killdeer – 3	Snowy Egret – 4
Meadowlark – 3	Horned Lark – 4
Shrike – 4	Coot – 2
Black-necked Stilt – 4	Pheasant – 3
Brewer's Blackbird – 3	Calif. Quail – 4
Song Sparrow – 4	Bittern – 4
Marsh Wren – 3	Western Grebe – 4
Yellow-headed Blackbird – 1	Forster's Tern – 4
Black Gallinule – 3	American Egret – 4
Cinnamon Teal – 4	Pied-billed Grebe – 4
Mallard – 2	Golden-crowned Sparrow – 4
Barn Swallow – 3	Black-crowned Night Heron – 4
Black Tern – 4	Least Sandpiper – 4
Calif. Gull – 3	Savanna Sparrow – 2

This is a total of 36 species seen today.

Mayhew
1952

April 29 — Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
Today was the first time I had seen a Western Grebe on the ranch. Horned Larks & Forster's Terns were seen for the first time this year. One Long-billed Dowitcher was seen just as I left the ranch, making 37 species seen today.

May 1 — At 5 AM. I went out to see where the Mallards were selecting nesting sites. All morning was spent looking for nests & broods. No Mallard nests were found, but 6 Mallard broods were seen & 1 Cinnamon Teal nest found. The birds seen today during my wanderings were:

Great Blue Heron — 3
Green Heron — 4
Black-bellied Plover — 3
Long-billed Dowitcher — 1
White Pelican — 3
Long-billed Curlew — 3
Cliff Swallow — 3
Barn Swallow — 2
Least Sandpiper — 3
Western Sandpiper — 3
Killdeer — 3
Mallard — 2
Coot — 2
Gallinule — 3
Pheasant — 3
Dove — 3

Calif. Quail — 3
Bittern — 4
Red-winged Blackbird — 1
Yellow-headed Blackbird — 2
Brewer's Blackbird — 2
Black Tern — 3
Forster's Tern — 4
Marsh Wren — 2
Cinnamon Teal — 2
Crow — 4
Avocet — 3
Black-necked Stilt — 3
American Egret — 3
Snowy Egret — 4
Savanna Sparrow — 1
Meadowlark — 3
Shrike — 4

Mayhew
1952

May 1 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Pintail – 4	Black-cr. Night Heron – 4
Red-backed Sandpiper – 3	Tri-colored Redwing – 4
Tree Swallow – 4	Calif. Gull – 4
Kingbird – 4	Pied-billed Grebe – 4
White-tailed Kite – 4	Northern Phalarope – 4
Turkey Vulture – 4	English Sparrow – 4
Horned Lark – 4	Calif. Jay – 4
Marsh Hawk – 4	Red-tailed Hawk – 4
Western Robin – 4	Song Sparrow – 3

This makes a total of 51 species seen today. This was the first time I had ever seen a Northern Phalarope or White-tailed Kite on the ranch, & the first time this year I had seen Red-backed Sandpipers, Black-bellied Plover, Anthony's Green Heron, & Western Kingbird on the ranch.

May 3 While looking for Mallard nests, I saw a single Wilson Snipe fly out of a dry field, the cover of which was only about 6 inches high.

May 5 On a quick trip around the Conaway Ranch this afternoon, the following species were seen:

Farallon Cormorant	White Pelican
Red-backed Sandpiper	Savanna Sparrow
Long-billed Curlew	Meadowlark
Cinnamon Teal	Horned Lark
Mallard	Willow Goldfinch
Pheasant	Brewer's Blackbird
Mourning Dove	Marsh Hawk

Mayhew
1952

May 5 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Sparrow Hawk	Shrike
Black-necked Stilt	Avocet
Barn Swallow	Cliff Swallow
English Sparrow	Coot
Black Gallinule	Marsh Wren
Black Tern	Forster's Tern
Killdeer	Canvasback
Calif. Gull	Black-cr. Night Heron
Red-winged Blackbird	Yellow-headed Blackbird
Great Blue Heron	American Egret
Snowy Egret	Song Sparrow

This makes a total of 36 species seen today. The number of shorebirds seen was much smaller than on May 1. Dowitchers, for example, that were quite numerous May 1 were not even seen today. I don't know whether this was due to the time the trip was taken (1 to 3 P.M.) or not. Today was the 1st time I had seen American (Willow) Goldfinches on the ranch, & the first time this year I had seen Double-crested Cormorants on the ranch. A pair of Canvasback were seen in the large drainage ditch at the south end of the ranch.

Mayhew
1955

Jan. 23 Lake Norco, U.S. Naval Hospital, Riverside Co., Calif.

This morning was spent looking at the waterfowl on the lake (from 10 A.M. to 1 P.M.). There were several thousand birds on the water, the majority being Baldpate. The day was clear and calm, with a temperature in the 60's.

The species seen on or near the lake were:

Baldpate – several thousand
Shoveller –
Mallard – several hundred
Coot –
Green-winged Teal –
Pintail – about 100
Canvasback –
Ruddy Duck –
Black-crowned Night Heron – about 20
Tri-colored Redwing – about 15
Audubon Warbler – about 6
Double-crested Cormorant – 6
American Merganser – 3
Ring-billed Gull – 4
Buffle-head – 3
White-crowned Sparrow – 2
Red-tailed Hawk – 2
Chinese Spotted Dove – 2
California Gull – 1
Ruby-crowned Kinglet – 1
Redhead – 2

Mayhew
1955

Jan. 23 Lake Norco, U.S. Naval Hospital, Riverside Co., Calif.
Anthony Green Heron – 1
Black Phoebe – 1
Mockingbird – 1

1957
Mar. 2 Univ. of Calif. campus, Riverside, Riverside Co., Calif.
Today the Zoology 146 class walked through the east side of the campus, due east of Webber Hall. It had rained a couple of days earlier, so everything was rather damp. Several Batrachoseps pacificus were found under boards near the old warehouse. Two Uta stansburiana were captured there also. The trip went past the small pond below the big swallow rock. The day was slightly overcast, but was quite warm. The species of birds seen were: Killdeer, Anna's Hummingbird, Song Sparrow, Sparrow Hawk, House Finch, Meadowlark (heard), Chinese Spotted Dove, Red-shafted Flicker, Brown Towhee, Calif. Quail, Violet-green Swallow, White-crowned Sparrow, Red-winged Blackbird, and Red-tailed Hawk.

Mar. 9 Today the Zoology 146 went to the eastern edge of the campus, then south to the future site of the botanical garden, then back by way of the new reservoir. We were rained on intermittently. One Sceloporus occidentalis was found in the crevice of some rocks, but no other reptiles were seen. The birds

Mayhew 1957

Mar. 9 Univ. Calif. campus, Riverside, Riverside Co., Calif. Seen today were: Red-winged Blackbird, Calif. Jay, House Finch, Killdeer, Anna's Hummingbird, White-crowned Sparrow, Audubon Warbler, Violet-green Swallow, Brown Towhee, Calif. Quail, Song Sparrow, Mourning Dove, Green-backed Goldfinch.

Mar. 29 East side of Salton Sea, Imperial Co., Calif.
The Zoölogy 146 field trips camped by a stream draining into Salton Sea approx. 16 miles south of Mecca, Riverside Co., Calif. Mammal traps were set and a number of Peromyscus sp. were caught and released. A breeze was blowing early in the evening, but this disappeared before we went to bed.

Mar. 30 This morning we searched along the stream and across some of the open desert near the sea. Birds seen near the stream were: Cliff Swallow, Tree Swallow, Violet-green Swallow, White-throated Swift, Nighthawk (sp?), White-crowned Sparrow, Coot. Birds seen on lagoons near the sea (in addition to those already mentioned) were: Avocet, Snowy Egret, Cinnamon Teal, Scaup (sp?), Redhead, Canvasback, Long-billed Dowitcher, Killdeer, Curlew (sp?). Lizards caught in the area were: Callisaurus, Uta (sp?), and Cnemidophorus tigris.
In the sand dunes S.E. of Niland, Imperial Co., Calif. were seen Mourning Doves. Lizards caught here were Uma notata and

Mayhew 1957

Journal

Mar. 30 East side of Salton Sea, Imperial Co., Calif. Callisaurus draconoides, One jackrabbit was seen. We were there during the afternoon, and few animals of any kind were seen. Camp tonight was made on the west side of the sea, on the road from ~~Highw~~ Highway 99 to Julian. Our camp was about 1/4 mile north of the Julian Road, 3.2 miles west of 99. (7.9 miles east of San Felipe Creek Bridge on Julian Road). Night collecting trips were made to within the Anza State Park area on Julian Road, on road to Borrego, and on road from Ocotillo to Split Mountain + the gypsum mine. On these trips, 25 Coleonyx variegatus were collected, as well as 1 Dipsosaurus dorsalis, one Arizona elegans (DOR) and 1 Chionactis occipitalis (DOR). One sidewinder (Crotalus cerastes) was found, but not collected. There was some breeze blowing early in the evening, but slackened during the night. Although mammal traps were set again tonight, no animals were caught.

Mar. 31 This morning we walked south from our campsite to San Felipe Creek. Several Callisaurus draconoides were caught, as well as 1 Phrynosoma m'callii (in a wash). Large numbers of annual plants were in bloom in the sand that had blown into the arroyos. Several species of beetles

Mar. 31 West side of Salton Sea, Imperial Co., Calif, were caught in the areas where these annuals were common. Two species of fish were caught in San Felipe Creek — Gambusia affinis and a species tentatively identified by Lars Carpelan as Gillichthys mirabilis, family Gobiidae. No Phainopepla were seen on this trip anywhere near San Felipe Creek, whereas in January, when Rudy Ruibal & I were there, large numbers were seen here.

Apr. 5 Today Rudy Ruibal & I left for the Salton Sea area. We left campus at 11:15 AM. and turned off highway 99 at Truckhaven, Imperial Co. We traveled west along the Arroyo Salada until we reached the Mud Hills. This area is quite barren as far as perennial vegetation is concerned, but a close inspection of the ground showed that lots of annuals are now present, & most of them are in flower. We proceeded down the Arroyo Salada until we crossed into Borrego State Park. During this time, we caught two kinds of mites & one Phrynosoma platyrhinos. Inside the state park we crossed Ella Wash, then Smoke Tree Wash, then traveled south on short wash. a little later this led us into San Felipe Creek Wash. We followed this south until we reached highway 78

April 5 West side of Salton Sea, Imperial Co., Calif. about 4 miles east of Ocotillo Wells, or Burro Bend. Night collecting along highway 78 between the two previously mentioned points produced one Chionactis occipitalis. Collecting on the road to Split Mountain from Burro Bend yielded one Phyllorhynchus. We saw 2 dead & 1 live sidewinder, and several live Coleonyx variegatus. Coleonyx were not nearly as plentiful on the road tonight as last week. There was about 1/4 of a moon tonight & none last week, but otherwise conditions appeared to be about the same.

Apr. 6 We drove into San Felipe Creek from our campground of last week (3.2 miles west of highway 79 on highway 78). We found Harpers Well is located about 1/2 mile west of our approach to the creek last week. One species of fish was actively breeding at this time. Two females were caught, but we were unsuccessful in catching any males. Along highway 78 we saw more than 100 Swainsons Hawks sitting on the ground, & low bushes, or circling in the air. We were able to approach them quite closely. About 11 AM the wind began to blow quite hard, and most of our gear became filled with sand. As we travelled west on

Mayhew
1957

April 6

West side of Salton Sea, Imperial Co., Calif. highway 78 we found areas where many desert perennials were blooming. During the trip, the following perennials were seen in flower: palo verde, ocotillo, creosote bush, Ceanothus, Encelia, barrel cactus, beaver-tail cactus, mesquite, agave, one species of yucca (west of Anza Desert State Park).

May 4

(On San Mateo Canyon Road.)

10 mi. N.W. of Murrieta, Riverside Co., Calif.
Today the field class collected along a small stream on the Vail Co. ranch. The stream wasn't flowing, but seemed to be a series of seeps. Two Rana boylii, one young Hyla regilla (?), 4 Taricha torosus, 1 Sceloporus multi-carinatus, 5 Clemmys marmorata, and a large number of Thamnophis elegans were collected, as well as a species of snail I have never seen before, + some aquatic mites. The area is open grassland in the level areas, changing to oak woodland in spots, + to chaparral on the slopes. One deer (doe), 1 cottontail, + several Beechy ground squirrels were seen. Birds seen were: mourning dove, sparrow hawk, red-tailed hawk, lark sparrow, horned lark, house finch, Bullocke's oriole, purple martin, Kingbird, red-winged blackbird, crow, meadowlark, red-shafted flicker, Calif. quail, roadrunner, green-

Mayhew 1957

Journal

May 4 10 mi. N.W. of Murrieta, Riverside Co., Calif. backed goldfinch, Calif. woodpecker, Calif. jay, turkey vulture, Brewers blackbird, Western bluebird, ash-throated flycatcher, killdeer, spotted towhee, brown towhee. Wren-tits were heard singing, but not seen.

May 11 Mojave Desert, San Bernardino Co., Calif.

Today the field class left at 6AM for the desert between Hesperia, Lucerne Valley, & Barstow. There was a cold wind (≈ 30 m.p.h.) blowing from the west, which reduced the number of active animals seen. Several Sceloporus magister were captured in the debris beneath Joshua trees near Hesperia, as well as numerous Xantusia vigilis. One Sauromalus obesus was caught in rocks about 7½ miles west of Lucerne Valley on highway 18. One large Cnemidophorus tigris was also captured at this spot, and several small ones were seen. Two Gopherus agassizi (1 large ♂, 1 young) were dug out of their burrows about 7 miles north of Stoddard Well. The birds seen in the desert were: horned lark, desert black-throated sparrow, Scott oriole, raven, one of the gnatcatchers, and Brewers blackbird (near Stoddard Well). The route taken through the desert was from Cajon Pass through Hesperia, to Lucerne Valley, to Stoddard Well, to Lucerne-Barstow road about

Mayhew 1957

Journal

May 11

4 miles south of Barstow, back to Lucerne Valley. We then started up Cushionberry Grade into the San Bernardino Mountains.

May 12 Hanna Flats, San Bernard. Nat'l. Forest, Calif.

We camped at about 7000 feet in pine - incense cedar - fir belt. Although a little snow fell on us coming up the grade, it melted as soon as it hit the cars. The temperature dropped to 31°F. during the night, but we were not uncomfortable. The sun shown through occasional clouds this morning. The weather was quite warm. One Uta stansburiana was the only reptile seen. Birds seen included wood pewee, hairy woodpecker, brown creeper, junco, chickadee, red-tailed hawk, robin, stellar jay. Snow could be seen on trees above our elevation. As we started down the rim-of-the-world highway, we hit dense fog a little below 7000 feet, and remained in such a fog until we reached approx. 4500 feet. There was 2-3 inches of snow on the ground from about 6500 feet down to about 5000 feet. In fact, there was sufficient snow on the ground for a good, old-fashioned snowball fight at the parking area at Snow Valley.

Mayhew
1957

May 30 Univ. Calif. campus, Riverside, Riverside Co., Calif.

While checking on the Bewick Wren's nest in the big rack today, I looked in all the nests, 33 of them contained some sort of material that had been brought in by birds — string, twigs, etc. Only the one containing the young Bewick Wrens contained either eggs or young now, but one brood of House Finches hatched earlier in the season.

1958
Feb. 4-6 Colorado Desert Trip, Riverside & Imperial Cos.

This morning at 10 A.M. Dan Goodcase and I left UCR campus in the university jeep in a heavy rainstorm. We were looking for areas that contain heavy growths of mistletoe, since phainopeplas are nearly always found in such areas in the desert. We traveled to Indio, south through Mecca (after being unable to pass through the Mecca Hills to Shaver's Summit) to Niland. Rain was falling intermittently there and further south, so we returned to Indio and headed for Blythe. We reached Desert Center about dark, so got something to eat there, then found a campsite 9 miles north of Desert Center on the road to Rice. By this time the

Feb. 4-6

Colorado Desert, Riverside & Imperial Cos., Calif.
sky was beginning to clear, so had a pleasant night. The next morning, Feb. 5., we looked over the area near our campsite, then proceeded to Blythe. We then returned to Mecca (by way of Desert Center and the Mecca Hills), and down the west side of the Salton Sea on highway 99 to highway 78 (Julian road). We followed highway 78 to the Borrego Springs road, then through Borrego Springs. No decent campsites could be found there, so we took Yaqui Pass to Yaqui Wells, where we camped for the night. (Dark had overtaken us just as we entered the Mecca Hills.) The next morning (Feb. 6) we investigated the Yaqui Well area. When we decided it was time to leave, we found the jeep starter wouldn't turn over the engine. After pushing and digging for some time, we walked to the ranger station nearby & got help to start the jeep. Since we didn't dare turn the engine off, we gave up the idea of driving in to San Felipe Creek & Harper's Well. Instead, we headed for Riverside, but detoured enough to

Feb. 4 - 6 Colorado Desert, Riverside & Imperial Cos., Calif. check on mistletoe stands at Indian Wells, Palm Desert, and on Dillon Road (east of Indio). We reached UCR at 3:45 PM. after a trip of 738 miles. The mistletoe stands were as follows:

1. Spots along highway 111 about 1 mile S. of Mecca. No phainopepla seen here.
2. Near Frink on east of Salton Sea. No phainopepla seen.
3. South of Bombay Beach on east side of Salton Sea. No phaino. seen.
4. Creek bed just north of junction of highway 195 with 60-70 ~~??~~, just past Shaver's Summit. There was lots of mistletoe here, but was too dark to tell if phainos. present or not.
5. 9 miles north of Desert Center on road to Rice. There were extensive area of ironwood, palo verde, creosote bush, burro bush, etc. with numerous bunches of mistletoe scattered through the area. Two pair of phainos. seen. (Dinothrombium sp. collected in fair numbers in sandy spots here.) Lots of house finches
6. Yaqui Wells. One area about 50 yards across that is covered with mistletoe. At least a dozen phainopeplas seen here, along with mockingbird, verdin, western bluebird, shrike, horned lark, house finch, cactus woodpecker, and

[illegible]

Mayhew
1958

Feb. 4-6 Colorado Desert, Riverside & Imperial Cos, Calif.

some unidentified hummingbirds.

7. On the west side of Salton Sea from Salton Sea Beach to the southern outskirts of Indio. There was lots of mistletoe on both sides of the road for miles. As we were traveling through the area rapidly, we didn't see many phainopeplas, but did manage to see a few. Our impression was that they were fairly numerous in that area.

8. Indian Wells. A number of phainos. were seen just east and across the road from Desi Arnaz' fancy hotel. Lots of mistletoe in that location.

9. Palm Desert. Up Deep Canyon south of the Palm Springs Wildlife Refuge. A couple of phainos seen here.

10. East end of Dillon Road just north of Indio. Lots of mistletoe & some phainos seen.

Quite a few wild flowers were seen on the trip, such as sand verbena, desert sunflower, Encelia, desert primrose, some kind of lupine, and many annuals I couldn't identify. Creosote bush was in bloom in some spots, but these blooms were rather restricted in their distribution at this time. One adult Callisaurus was caught (Desert Center) & another seen on entire trip.

[illegible]

Mar. 21-23 Salton Sea region, Calif.

At 2:30 P.M. Friday, March 21, the Zoology 146 class (23 students attending), Ed Kos & Rudy Ruibal accompanied me to the west side of the Salton Sea near Truckhaven. We took the Truckhaven Trail toward Borrego, camping 8 miles west of Truckhaven. It began to rain very hard about 2 A.M. Saturday morning, and didn't stop until 5:30 A.M. Everyone that could got back into the station wagons & pick-up to spend the rest of the night. The sun came out that morning, however, and dried everything out. We left Truckhaven about noon Saturday & proceeded to Highway 78, stopping due north of the junction of San Felipe & Carrizo Creeks (marsh of San Sebastian). One half of the students accompanied me to the creeks while the other half ran temperature transects through mesquite dunes. Then we traded groups and repeated the operation. The creeks were quite high and terribly choked with silt from the heavy rains. This is the only time I have ever seen the Arroyo Salada and San Felipe Creek at

Mar. 21-23 Salton Sea region, Calif.
the Highway 78 bridge with water flowing on the surface. We spent the night (Saturday) camped in an old stone shell of a building about 1/2 mile east of Burro Bend to get out of the wind that had been blowing all day. Sunday morning we drove to Yaqui Well to look at birds & try to find some reptiles. We then returned to Riverside, arriving at 5:30 P.M. Sunday. Because of the bad weather, not as many animals were found as expected. However, the following animals were seen or captured:—

8 mi. W. Truckhaven:
White-throated swift
Horned lark
Hadrurus hirsutus
Coleonyx variegatus
Hypsiglena torquata
Crotalus cerastes
Uta stansburiana

San Felipe Creek area:
Sage thrasher
Horned lark
Phainopepla
House finch
Turkey vulture
American goldfinch
Cnemidophorus tigris

Journal

Mar. 21-23 Salton Sea region, Calif.

Yaqui Well region:

Phainopepla	Loggerhead shrike
Hermit thrush	Mockingbird
Scott's oriole	House finch
American goldfinch	Anna's hummingbird
Verdin	Costa hummingbird
Audubon's warbler	Crow
Yellowthroat	White-crowned sparrow
Cedar waxwing	Turkey vulture
Mourning dove	Blue-grey gnatcatcher
Gambel quail	Robin
Yellow-headed blackbird	Crotalus ruber
Uta stansburiana	Cnemidophorus tigris
Uta graciosa	Lepus californicus
Sylvilagus audubonii	

along road on way home:

Meadowlark	Mourning dove
Brewer's blackbird	House finch
Red-winged blackbird	House sparrow
Crow	Sparrow hawk
Band-tailed pigeon	Citellus beecheyi
Sylvilagus auduboni	

In all, 1 species of scorpion, 1 species of fish (yet unidentified), 3 species of snakes, 4 species of lizards, 30 species of birds, and 3 species of mammals were seen, for a total of 42 species. (The fish were collected in San Felipe Creek, swimming near the top of the silt mass.)

Mar. 29

Colorado and Mojave Deserts, Calif.

This morning at 10 A.M. Frank Vasek & I started on a scheduled 5-day trip through the Northern Colorado Desert and most of the Mojave Desert as far as Death Valley. The weather was partly cloudy but fairly warm. (Speedometer reading 2897.) We drove through Indio to Mecca, then through Box Canyon in the Mecca Hills to Desert Center. We went north toward Rice from Desert Center, but off on another road to cross Danby Dry Lake. When we reached the Santa Fe railroad tracks, we turned left to parallel the tracks through Chubbuck to Cadiz, then along the highway to Amboy. After refueling, we took the road toward Kelso from highway 66 east of Amboy. We camped for the night at 8:30 P.M. about 4 miles north of highway 66. (Speedometer reading: 3144.). Flowers were growing in profusion about 8 miles north of Desert Center. There were also fairly abundant areas in Box Canyon & just north of Danby Dry Lake. Although a large number of lizard tracks were seen near Desert Center, no lizards were seen all day. Audubon warblers, phainopeplas, & mockingbirds were seen.

Mar. 30 Colorado and Mojave Deserts, Calif.

This morning near our campsite birds were much in evidence. Black-chinned sparrows were rather abundant and quite vocal early. By 8 A.M. they had stopped singing, however. Their territories may be rather small, apparently, since several could be seen in the tops of perennials & heard singing in a remarkably small area (less than 5 acres). Other birds seen at this site were: rock wren, Costa hummingbird, Cassin's kingbird, house finch, ash-throated flycatcher, Audubon's warbler, phainopepla. The campsite is in a dry wash along the northern base of the Bristol Mountains. We left camp at 8:30 A.M. We drove along a gravel road toward Kelso until we reached a road turning left toward the the Kelso sand dunes. The road is 8.5 miles south of Kelso. We spent considerable time at the dunes, after driving 4.9 miles from the road to Kelso to the south side of the dunes. Large numbers of wild flowers were seen along the road from last night's camp to Kelso. We left Kelso by way of a road that turned due west at Kelso, went through a pass toward the Devil's Playground, then turned north on a dirt road toward Baker just east of the

Mar. 30 Mojave Desert, Calif.

Devil's Playground. Wildflowers were very abundant in this area, but the road was quite sandy in places, & sand had blown into several of the washes, so it was rather hard to get through some of them. The route from Kelso to Baker was 38 miles long. We took highway 127 out of Baker, heading for Death Valley. We camped for the night at Saratoga Springs, just inside the national monument boundary. The wind was continuous, but reasonably gentle from Kelso dunes to Baker, However, from Baker to the national monument, the wind blew like the devil. Nevertheless, we were able to camp in the lee of some tamarisks, & the wind at the springs was not nearly so violent. The sky is almost completely overcast. (Speedometer reading: 3274.2.)

Mar. 31 Mojave and Amargosa Deserts, Calif. & Nev.

This morning at 7AM we left Saratoga Springs and headed north along the floor of Death Valley. The sky was partly overcast all day, and a fairly strong SW breeze was blowing most of the time, but the temperature was reasonably warm. We stopped for a while at Badwater and collected some insects and I think mites. The salinity is

[illegible]

Mar. 31

Mojave and Amargosa Deserts, Calif. & Nev.

supposed to be only 5%, so it wasn't too surprising to find insects there. A water sample and some pupa cases were also collected in the Amargosa River. At Furnace Creek, we took highway 190 to Death Valley Junction, then highway (Calif.) 127 - (Nev.) 29 to Lathrop Wells, Nevada, followed by U.S. Highway 95 to Beatty, Nevada. We side-tracked through Rhyolite (a ghost town), then continued on Nevada highway 58 to the turn-off to Titus Canyon. We proceeded 9.7 miles up the road to Titus Canyon where we camped for the night at 5:30 P.M. (Speedometer reading - 3464.0.) I failed to mention a side-trip we took through Artists Drive before we reached Furnace Creek. One climbs a couple of thousand feet (it appears) above the floor of Death Valley, so one gets a fine view of the valley in both directions. Very few vertebrates were seen all day. Some raven and rock wrens were seen at our campsite, but little else was seen. Not many flowers were found in the southern end of Death Valley, although many of the perennials looked as though a fair amount of rain had fallen this winter. Most of the Amargosa

Mar. 31 Mojave and Amargosa Deserts, Calif. & Nev. Desert seemed to be in winter yet, although the perennials looked in good shape. Lots of annuals were seen in some spots, but in most places they were not in flower yet.

April 1 Rain began to fall about 3 A.M., but since we had decided before going to bed that it probably would rain, we were sleeping in the back of the station wagon already. We arose at 5:30 A.M., and after a very quick breakfast, we were packed and on the road by 6:30 A.M. As the dirt road was becoming rather slick by this time, we decided we had better not try to go on through Titus Canyon. Therefore, we returned to Highway 58 in Nevada, then to the floor of Death Valley through Daylight Pass. The weather here was overcast, but not raining. We turned north on highway 190 to reach the north end of the valley. We turned around a Death Valley Scotty's Castle and retraced our steps. It was raining in the valley by this time. We could see that snow was still falling above where we had camped (some snow and hail had fallen on us before we broke camp). A strong wind was blowing on

April 1 Mojave and Amargosa Deserts, Calif. & Nev.

the valley floor, whipping large amounts of sand across the highway north-east of Stovepipe Wells. Just north of this area, however, the rain came down on us so hard the windshield wipers could barely keep the windshield clean. We left the valley on highway 190, past Stovepipe Wells, over Townes Pass into the Panamint Valley. We ate lunch behind the ranger's checking station on this road while the rain came down so heavily we could scarcely see 100 yards in any direction. It was not raining very hard in Panamint Valley, but the snow level on the surrounding mountains was so low that the weather was quite cold. The same general weather conditions prevailed as we went through Trona, Johannesburg, Red Mountain, and Atolia. Quite a bit of rain fell on us as we drove down highway 395 toward San Bernardino, but we ran into fog instead in Cajon Pass.

We saw few animals all day, but the wildflower displays were very good in several places. For instance, at the lower end of Daylight Pass, at the western end of Titus Canyon,

[illegible]

April 1 Mojave and Amargosa Deserts, Calif. & Nev. near Mesquite Springs in the northern end of Death Valley, in Panamint Valley, south-west of Trona, in the Kramer Mts. between Adelanto & Four Corners. We reached Riverside at 8 P.M., after traveling 355 miles today. (The speedometer reading: 3818,9). The total distance traveled the past four days is 922 miles.

April 12 UCR campus, Riverside, Riverside Co., Calif.

This morning Rudy Ruibal & I took the Zoology 146 class for a trip on campus. We divided the class in half and took off in opposite directions. The weather was perfect. Animals seen by the two groups were as follows:

Hyla regilla (ad. & larvae)	Scaphiopus hammondi (larvae)
Pituophis catenifer	Lichanura roseofusca
Uta stansburiana	Sceloporus orcutti
Phrynosoma coronatum	" occidentalis
Raven	Sparrow hawk
House finch	Crow
Calif. quail	Scrub jay
Cliff swallow	Song sparrow
Cedar waxwing	Bush-tit
Brewer's blackbird	Brown towhee
Mourning dove	Red-tailed hawk
White-throated swift	Mockingbird
American goldfinch	White-crowned sparrow
Rufous-sided towhee	Roadrunner

April 12 UCR campus, Riverside, Riverside Co., Calif.

Redwinged blackbird Killdeer
Anna's hummingbird Western kingbird
Bewick wren Meadowlark
Lawrence goldfinch _Citellus beecheyi_
Lepus californicus _Sylvilagus audubonii_
Batracoseps sp. Black phoebe

Thus, 40 species of vertebrates were seen on this trip.

April 14 This afternoon Duane Munro & I walked toward the east end of the campus. In addition to species seen Saturday by the Zool. 146 class, we saw Bullock's oriole & Calif. thrasher.

April 19 Field Trip to Palm Desert, Riverside Co., Calif.

This morning at 6:15 A.M. the field zoology class left UCR for Palm Desert. We stopped in the chaparral habitat a few miles east of Hemet for about an hour. The animals seen here were:

Anna's hummingbird House finch
Scrub jay Ash-throated flycatcher
Wren-tit Rufous-sided towhee
Bewick wren Brown towhee
Mourning dove White-crowned sparrow
Violet-green swallow Red-shafted flicker
Sceloporus orcutti _Uta stansburiana_
Sceloporus occidentalis _Cnemidophorus tigris_
Odocoileus hemionus

We then moved into the coniferous

Apr. 19 Field Trip to Palm Desert, Riverside Co., Calif.
forest north of Idyllwild and saw:
(White-breasted) ~~Slender-billed~~ nuthatch Red-shafted flicker
Acorn woodpecker Junco
Plain titmouse *Sceloporus occidentalis*
Uta stansburiana

Although the weather was warm here, there were still a few small patches of snow remaining on the ground.

The next stop was the pinyon-juniper area at Pinyon Flats. Here we found:

Xantusia vigilis *Uta stansburiana*
Phrynosoma coronatum *Callisaurus dracon.*
House finch Plain titmouse
Scrub jay

The 2 *Phrynosoma coronatum* were toe-clipped and released.

A short time was spent in the desert scrub habitat a few miles S.W. of Palm Desert on the Palms to Pines Highway. The animals seen were:

Phainopepla White-throated swift
House finch Black-throated ~~chinned~~ sparrow

No reptiles were seen here on this trip.

In the desert wash at the Palm Springs Desert Museum Sanctuary, where we camped for the night, we saw the following:

Uta graciosa *Hyla arenicolor*

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April 19 Field Trip to Palm Desert, Riverside Co., Calif.

Phainopepla (~~[illegible]~~) Mourning dove
Loggerhead shrike Canyon wren
Mockingbird Lesser nighthawk
House finch Black-throated sparrow
Gambel quail *Xantusia vigilis*
Callisaurus draconoides *Uta stansburiana*
Dipsosaurus dorsalis *Crotaphytus collaris*
Cnemidophorus tigris *Crotalus cerastes*
Perognathus longimembris *Dipodomys deserti*

Mammal traps were set out by the students before dark. They were checked periodically until about mid-night. *Perognathus longimembris* was the only species caught (5 of them). At least 2 sidewinders were seen during the evening by those checking traps. The *Perog.* were toe-clipped + released.

I took two groups out night collecting. The first group drove along the Rio del Sol road from Rancho Mirage to 1000 Palms, then along the old highway from 1000 Palms to Garnet and return to 1000 Palms + Rio del Sol. Animals seen dead on the road were:

Phrynosoma platyrhinos (3)
Phrynosoma m'calli (1)
Dipsosaurus dorsalis (1)
Uma inornata (1)
Callisaurus draconoides (2)

Apr. 19

Field Trip To Palm Desert, Riverside Co., Calif.
Coleonyx variegatus (1)
Dipodomys deserti (3)
Animals captured on the first trip:
Phyllorhynchus decurtatus (2)-1.4 mi. W. of 1000 Palms on old highway; 2.8 mi. W. of 1000 Palms on old highway.
Callisaurus draconoides (1)-2.9 mi. W. of 1000 Palms on old highway.
Coleonyx variegatus (1)- 5 mi. W. of 1000 Palms on old highway.

The second trip out used Rio del Sol road to 1000 Palms, then east on the road to 1000 Palms Canyon until the road was no longer paved. We then followed the old highway west from 1000 Palms to a paved road the S. Calif. Edison Co. maintains along its power line. We followed this until the pavement stopped, then turned on Dillon Road. This road was followed until a sign pointed to Indio to our right, which road led us back to the old highway again + then back to camp. Dead animals seen were:
Uma inornata (1)
Phrynosoma platyrhinos (2)
Callisaurus draconoides (1)
Crotalus cerastes (1)
Dipodomys sp. (1)

Apr. 19 Field Trip to Palm Desert, Riverside Co., Calif.
Live animals seen but not captured:
Crotalus cerastes (1)
Vulpes macrotis (1)
Animals collected were:
Phrynosoma platyrhinos (1) — 5.4 mi. W. of 1000 Palms on old highway.
Dipodomys deserti (1) — 10.1 mi. W. of 1000 Palms on power line road.
Coleonyx variegatus (2) — 10.4 mi. W. of 1000 Palms on power line road; 11.1 mi. W. 1000 Palms on power line road.

The number of animals out seemed to be greater early in the evening. The weather was warm & calm all evening.

Apr. 20 This morning, after picking up the mammal traps, we went into Deep Canyon. There is a large amount of water coming out of the canyon, but all of it is sinking into the bajada before it reaches the P.S.D.M. Sanctuary—at least most of the time. During the night water flowed into the temporary pond on the refuge, apparently due to the increased melting of snow yesterday from the extra warm temperature (102°F. at Palm Desert). Water stopped reaching this far down the canyon by 9 AM this morning, however. We walked up the canyon for a mile or so, until it became so narrow we

Apr. 20 Field Trip to Palm Desert, Riverside Co., Calif.
couldn't get around the water flowing down the bottom. The temperature recorded for Indio today was 109°F., for La Quinta, 108°F., so it must have been at least 110°F. in the canyon or higher. Unfortunately, we didn't have a thermometer along to check. At any rate, it was quite warm, especially when we got very far away from the stream.

Turkey vulture

Animals seen in the canyon were:

Mourning dove	White-throated swift
House finch	_Dipsosaurus_ _dorsalis_
Cnemidophorus _tigris_	_Crotaphytus_ _collaris_
Hyla _arenicolor_	_Uta_ _mearnsi_
Bufo _punctatus_	Gambel quail
Uta _stansburiana_	_Sauromalus_ _obesus_

One _C. collaris_ was marked & released in the canyon — 1 was brought back to UCR. One _Uta_ _mearnsi_ was caught & brought back, as was one _Dipsosaurus_ _dorsalis_. The 1 _Xantusia_ that was caught in the Sanctuary was toe-clipped and released. We also marked 2 _Callisaurus_ _draconoides_, 5 _Perognathus_ _longimembris_, 2 _Uta_ _graciosa_, & 2 _Uta_ _stansburiana_ at the Sanctuary and released them. In Deep Canyon, we marked & released:

1 _Crotaphytus_ _collaris_

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Apr. 20 Field Trip to Palm Desert, Riverside Co., Calif.
6 *Hyla arenicolor*
1 *Uta stansburiana*
We left the canyon at 3:30 P.M., and reached Riverside at 6:15 P.M.

May 3 Mojave Desert, San Bernardino Co., Calif.

(Zool 146 class)

This morning at 8:15 AM (PDST) we left Riverside for the Cedar Springs area, north of Crestline, San Bernardino Co., Calif. We reached the Mojave River about 2 miles north of Cedar Springs at 9:15 AM. Rudy Ruibal took one group to look for reptiles & amphibians while I took the other group to look for birds. Neither group got more than 200 yards in either direction from the bridge. Nevertheless, when we stopped for lunch at noon, we had the following list of animals seen or collected:

Scrub jay	Turkey vulture
Mourning dove	Yellow warbler
Bewick wren	House wren
Brown-headed cowbird	Bullock's oriole
Chipping sparrow	Black-headed grosbeak
Black phoebe	Red-shafted flicker
ash-throated flycatcher	Bush-tit
Nuttall's woodpecker	Brewer's blackbird
Sparrow hawk	Western bluebird
Plain titmouse	*Empidonax* flycatcher
Calif. quail	Wren-tit

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May 3 Mojave Desert, San Bernardino Co., Calif.
Western tanager Lazuli bunting
Hyla regilla Hyla arenicolor
Bufo microscaphus Uta stansburiana
Sceloporus occidentalis Masticophis lateralis
Lampropeltis getulus Phrynosoma coronatum
Citellus beecheyi
The water temp. of the stream was 15°C.
We followed the Mojave River to Hesperia, where we stopped for a few minutes to look for animals in a Joshua tree - juniper association. The animals seen or collected here were:
Mourning dove Meadowlark
Western kingbird Turkey vulture
Sage sparrow Xantusia vigilis
Sceloporus magister Uta stansburiana
Phrynosoma platyrhinos Masticophis flagellum
We planned to go east from Hesperia to Deep Creek, but the Mojave River had washed out the road. The river was about 1/4 mile wide and about a foot deep. At this point, Warren Gross & his brother-in-law left us at 3PM. and Rudy Ruibal left with one station-wagon full at 3:30PM. The other three vehicles (2 Chev. station wagons & 1 Plymouth sedan) drove north of Hesperia until we reached a road that turned east toward Lucerne Valley. We drove until we were about

[illegible]

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May 3

Mojave River, San Bernardino Co., Calif.
8 miles west of Lucerne Valley at the southern tip of the Granite Mountains. Here we saw or captured the following (4 to 6 PM):

Crotalus mitchelli (2) Masticophis flagellum
Phrynosoma platyrhinos Crotaphytus wislizeni
Sceloporus magister Uta stansburiana
Sauromalus obesus Xantusia vigilis
Sage sparrow

Two of the cars left us at 6PM at this site while those of us left proceeded to Lucerne Valley, then north toward Barstow. We took the dirt road through Upper Lucerne Valley to Stoddard Well, then north toward the paved road to Barstow. About a mile south of the paved road we stopped to look for Gopherus agassizi. We found two young ones and several holes of others just as the sun set. Then we tried night collecting on the paved road from Barstow to Lucerne Valley. No nocturnal animals were found, but numerous diurnal animal remains were found on the highway, as well as one live Crotalus cerastes: Dipsosaurus dorsalis

Crotalus scutulatus Crotaphytus wislizeni
Uta graciosa Callisaurus draconoides
Phrynosoma platyrhinos

Near Lucerne Valley we saw a

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May 3 Mojave Desert, San Bernardino Co., Calif.
pair of *Canis latrans* and caught
a couple of *Bufo boreas*. We reached
UCR at approximately 11:30 PM (PDST).
During the day we saw 3 live rattlers
and one dead one, so they seem to be
more numerous this year. In fact, we
have seen live rattlers on every class
trip this year. Ed Kos nearly stepped
on one today, but luckily it didn't
strike at him. We caught 6 chuckwallas
this trip, + saw 3 more, at the same
spot we saw and caught only one last
year. The weather today was nearly
perfect — no appreciable wind and
temperatures in the 80's.

May 10 Univ. Calif. campus, Riverside, Riverside Co., Calif.
This morning at 8:40 AM (PDST) the
Zoology 146 class began a field trip
to the east side of the campus.
Rudy Ruibal took ½ the class +
mapped some quadrats after looking
for animals for a while. My group
(with Bobby on his first field trip)
spent the morning looking for
animals. The early portion was
spent looking at birds, the latter
portion was spent looking for
reptiles. The morning was overcast,
but no rain fell during our trip.
The animals seen were:

May 10 Univ. Calif. campus, Riverside, Riverside Co., Calif.

American goldfinch Lesser goldfinch
Bullock's oriole House finch
Mourning dove Anna's hummingbird
Song sparrow Cliff swallow
Red-shafted flicker Calif. quail
Mockingbird Brown towhee
Cedar waxwing Brewer's blackbird
Crow Black-chinned hummingbird
Killdeer Lawrence's goldfinch
Costa hummingbird Common bush-tit
Wren-tit Western kingbird
Sage sparrow Roadrunner
Sylvilagus auduboni _Lepus californicus_
Cnemidophorus tigris _Phrynosoma coronatum_
Cnemidophorus hyperythrus _Sceloporus orcutti_
Sceloporus occidentalis _Uta stansburiana_
Lampropeltis getulis Bewick wren
Citellus beecheyi

35 species of vertebrates were seen this trip compared to 40 species seen when the class was in the same area April 12.

Those seen last trip but not this were:

Hyla regilla _Scaphiopus hammondi_
Pituophis catenifer _Lichanura roseofusca_
Raven Black phoebe Sparrow hawk
White-throated swift Scrub jay
White-crowned sparrow Rufous-sided towhee
Red-tailed hawk Red-winged blackbird
Meadowlark _Batrachoseps_ sp.

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1958

May 10 Univ. Calif. campus, Riverside, Riverside Co., Calif.
Those seen this trip but not last are:
Lesser goldfinch Bullock's oriole
Red-shafted flicker Costa hummingbird
Black-chinned hummingbird Wren-tit
Sage sparrow Cnemidophorus tigris
Cnemidophorus hyperythrus Lampropeltis getulus

A roadrunner was found in the lizard cage when Ruibal's group returned, so it was collected + opened to see if it had eaten any of the lizards. None were found in its stomach or crop.

May 16 This afternoon at 1:45 P.M. the Zoology 146 class left UCR for the Mojave Desert. We drove through Cajon Pass past Hesperia, then turned right toward Lucerne Vally, stopping at the Granite Mountains, 8 miles west of Lucerne Valley. At this location we saw or captured the following animals:
Rock wren Black-throated sparrow
Sauromalus obesus Xantusia vigilis
Phrynosoma platyrhinos Sceloporus magister
Crotaphytus collaris Crotaphytus wislizeni
Uta stansburiana Cnemidophorus tigris
Lepus californicus

We remained at this location from 3:50 P.M. to 5 P.M. (PDST).

Then we drove through Lucerne Valley and turned left on the road that goes to Barstow.

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May 16

Mojave Desert, San Bernardino Co., Calif.
Along the road north of Lucerne Dry Lake we caught one *Callisaurus draconoides* and 2 *Gopherus agassizi* (9 miles N. of Lucerne Valley). We camped for the night along a dirt road that was west of the Lucerne Valley-Barstow Road. We were 6.1 miles S. of Barstow where the dirt road left the pavement, then 1.2 miles S.W. on Stoddard Well Road. At this site we saw or caught the following animals:

Gopherus agassizi	*Callisaurus draconoides*
Crotaphytus collaris	*Sauromalus obesus*
Phrynosoma platyrhinos	*Cnemidophorus tigris*
Crotaphytus wislizeni	*Citellus leucurus*
Rock wren	Horned lark
Western tanager	Phainopepla

4 *Gopherus agassizi* were taken from UCR, marked, and released near our camp, and about 45 feet east of a U.S. Geological Survey bench mark (73LC, 1952, 2601 feet above sea level). Another tortoise was caught at camp and released with the other 4. These were released about 8 P.M. All but the smallest one (No. 3) were still in the same location when checked for the last time at 1:45 A.M. 5/17/58. After dark Ruibal took one car-load night collecting and I took

May 16 Mojave Desert, San Bernardino Co., Calif.
another load. In addition, mammal traps were set by the class. Animals caught that night were:

Rhinocheilus lecontei Lichanura roseofusca
Callisaurus draconoides (gravid - 5 eggs)
Crotalus cerastes Crotalus mitchelli (DOR)
Bufo boreas Perognathus longimembris
Crotaphytus wislizeni Dipodomys merriami (traps)

Also seen were:

Canis latrans Dipodomys sp.

May 17 Additional specimens of the species mentioned previously were caught this morning. A female Dipsosaurus dorsalis was also captured 2 miles S. of Barstow as we returned from breakfast. After breakfast we began looking for the marked tortoises that had been released near the bench mark (3 other tortoises were marked & released at the campsite & 4 young ones were brought back to Riverside). Only one (No. 4) was found, and it was approximately 1/4 mile S.E. of the release point (found at 11:30 A.M. [PDST]). In spite of our efforts, none of the others were located. However, 2 Crotalus cerastes were found in Gopherus dens. Mark Kohn caught one of them and brought it back to camp. Later, Rudy Ruibal demonstrated how fast the

Mayhew 1958

May 17

Mojave Desert, San Bernardino Co., Calif. desert sand can kill a sidewinder. The surface temp. was 145°F. (air temp. 108°F.) when the snake was placed on the sand. Four and 1/2 minutes later, approximately, the snake was dead. Shortly after noon we started for Lucerne Valley again. Rudy Ruibal made some temperature readings while we were camped at Stoddard Well Road:

16 May 1958	6:30 P.M. (PDST)
Air (1 meter above ground)	31°C.
Surface	39
7 cm. deep	41
20 cm. deep	38
Sundown	
	7:30 P.M.
air	28
Surface	32
7 cm. deep	39
20 cm. deep	33
	8:30 P.M.
air	23
Surface	22
7 cm. deep	36
20 cm. deep	31
17 May 1958	5:45 A.M.
air	16
Surface	17
7 cm. deep	27
20 cm. deep	27

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May 17 Mojave Desert, San Bernardino Co., Calif.

Sun-up

	7 A.M.
air	24
Surface	23
7 cm. deep	23
20 cm. deep	25
	8 A.M.
air	27
Surface	32
7 cm. deep	25
20 cm. deep	25
	11:30 A.M.
air	39
Surface	57
7 cm. deep	36
20 cm. deep	27
	1 P.M.
air	42
Surface	62
7 cm. deep	39
20 cm. deep	27

We set up camp at Hanna's Flat campground in the San Bernardino Nat'l. Forest above Fawnskin (near Big Bear Lake) about 5:00 P.M. (PDST). We set out mammal traps that evening, but did no zoologizing otherwise.

May 18 Hanna's Flat, San Bernardino Co., Calif.

This morning we checked the traps. Three Peromyscus maniculatus were

May 18 Hanna's Flat, San Bernardino Co., Calif.

all that were caught. The rest of the morning was spent looking for animals. Those captured or seen were:

Steller's jay	acorn woodpecker
Western wood pewee	Red-shafted flicker
Band-tailed pigeon	Red-tailed hawk
Tree swallow	Purple finch
Western tanager	Robin
Turkey vulture	Fox sparrow
Red-breasted sapsucker	White-headed woodpecker
White-breasted nuthatch	Junco
<u>Uta stansburiana</u>	<u>Sceloporus occidentalis</u>
<u>Eumeces</u> sp.	<u>Sceloporus graciosus</u>
<u>Gerrhonotus multicarinatus</u>	<u>Sciurus griseus</u>
<u>Citellus beecheyi</u>	<u>Eutamias speciosus</u>

We left Hanna's Flat about noon, stopped at Snow Valley for a snowball fight, then proceeded to UCR, which was reached about 4 P.M. (PDST).

May 23 Borrego area, Colorado Desert, San Diego Co., Calif.

This evening Warren Gross & I (5:50 PM) drove to Scissors Crossing between Julian & Borrego where highways 78 and 79 cross. It took exactly 2 hours from UCR to the intersection. There we met John & Chris Morrisey to do some night collecting. Warren & I went in one car, John & Chris in the other. We drove down the road toward Vallecito, down toward Yaqui Wells &

Mayhew
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May 23 Borrego area, Colorado Desert, San Diego Co., Calif. beyond to Burro Bend (Ocotillo Wells) + return to Scissors Crossing. Night collecting was quite good. The kinds and numbers collected were as follows:

Rhinocheilus lecontei (1)
Pituophis catenifer annectans (1)
Crotalus cerastes (1)
Crotalus mitchelli (1)
Masticophis flagellum (2) (1 DOR)
Lampropeltis getulus (1)
Chionactis occipitalis (7)
Phyllorhynchus decurtatus (4)
arizona elegans (5)
Leptotyphlops humilis (2)
Hypsiglena torquata (1)
Trimorphodon vandenburghi (1)
Coleonyx variegatus (8)

We finally stopped picking up Coleonyx even though several more were seen. We brought home most of the specimens captured by both teams. In all, we caught 27 snakes of 12 species besides the Coleonyx. As far as night collecting goes, this was the best night I have ever experienced. We returned to Riverside the same night, reaching home at 4:30 A.M. (PDST). All of the animals were still in good shape when we reached home.

Mayhew
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June 11

Colorado Desert, Calif.

This morning at 9:30 A.M. (PDST) Frank Awbrey, Duane Munro, Mark Kohn, Fritz Zaebst & I left UCR. We drove to Banning, then up the Banning-Idyllwild road. We stopped once in the rocky area a mile or two out of Banning to look for Xantusia henshawi and Phyllodactylus tuberculosus, but we didn't find any of either. Our next stop was on a branch of the San Jacinto River. We caught several Sceloporus graciosus here, as well as some Sceloporus occidentalis. After lunch, we drove through Idyllwild to Mountain Center, where we turned left on State Highway 74 toward the desert. We turned right at Paradise Valley Junction toward Anza, Coahuila & Aguanga. At Aguanga we turned left on State Highway 79. We continued on this road until we were about 6 miles south of Julian. At this point we turned onto Sunrise Highway, which goes through the beautiful Laguna Mts. We then turned left onto Highway 80. Three miles east of Jacumba, San Diego Co., we stopped to look for animals. We caught 1 Uta mearnsi and saw 2 more. We also caught 1 Sceloporus orcutti (♀). It was late

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June 11 Colorado Desert, Calif.
afternoon (about 6 PM), so there weren't many reptiles still active. We turned onto State Highway 98 & headed toward Calexico. We stopped near an abandoned adobe house for supper. The wind was blowing very hard, so we tried to use the remains of the shack for a wind-break without too much success. At dark we started toward Calexico again, night-collecting on the way. We picked up 3 _Bufo woodhousei_ 7 miles west of Calexico on the road. 6 miles east of Calexico we picked up a _Rhinocheilus_. ~~(DOR)~~ Between Calexico & Winterhaven we caught 3 specimens of _Arizona elegans_ and 1 _Phyllorhynchus decurtatus_. The wind was blowing rather strongly all evening, and the weather was cool for this time of year, so we didn't find too many animals out. We made camp about 2 AM about 35[redacted] miles west of Winterhaven, Imperial Co., Calif., or 22 miles east of Calexico. The wind had about disappeared by the time we camped for the night.

June 12 At 7:30 AM we headed east on Highway 80 to get to the Sand Hills (also called Yuma Dunes or Algodones Dunes). We caught several _Uma notata_ in the

June 12

Colorado Desert, Calif.
dunes and saw the tracks of numerous other animals. *Uma* were the only animals seen, however. We left the dunes at 10:30AM (PDST) (temp of air – 84°F.) and headed west again. We stopped 11 miles west of the Sand Hills to look for reptiles. The creosote bushes were like young trees in the area. The vegetation looked so verdant, we thought the area must be crawling with reptiles. However, we saw nothing but tracks for the first 45 minutes or so. We were on our way back to the car when Fritz spotted a *Dipsosaurus dorsalis*. We spent another hour searching after that. During this time, 5 *Dipsosaurus* were captured and 2 more seen. One *Callisaurus draconoides* was also seen. None of the animals were over 50 yards from the highway, even though we walked a considerable distance from the road. Then we drove to El Centro for "brunch" and some rest. After an hour or so in the park in El Centro, we drove up Highway 99 to Highway 78, where we turned left + proceeded to Burro Bend. After a side trip to look at Split Mountain, which is rather spectacular,

[illegible]

June 12 Colorado Desert, Calif.
We began night collecting along Highway 78 and also along the road leading to Borrego Springs. Although no wind had been blowing during the day, it blew quite hard after sundown. The temperature was a good deal below normal for this time of the year (got to 59°F. during the night). Consequently, almost nothing was on the road. A total of 3 Phyllorhynchus decurtatus were finally collected, and all of these were on the Vallecito Road. (This road is now paved 16 miles from Scissors Crossing.) We returned to Yaqui Well at 12:30 AM & camped for the rest of the night.

June 13 After observing the birds around Yaqui Well for a while this morning, we started for home at 10:30 AM. 3½ miles south of Warner's Hot Springs we found a small bridge with a good-sized colony of cliff swallows. It would be an easy bridge to work — no water, low, can be competely sealed. 26 miles N.W. from Warner's Hot Springs another bridge was found that contained cliff swallows and bats (Myotis ~~[illegible]~~ yumanensis). It would be a fair bridge to work, but it is rather high, & the nests are between

June 13 Colorado Desert, Calif.
the wooden rafters. A large number of bats were found in the cracks. Another bridge was found 2½ miles west of the previous one (Dripping Springs), which also would be easy to work. Another bridge 5.3 miles west of this one (5½ miles east of junction of Highways 71 & 395) could not be worked effectively. (It is exactly 40 miles from this junction to UCR.) We reached UCR at 2:30 P.M. We travelled a total of 722 miles during the 2½ days we were out in the field.

August 1 This morning at 0600 Frank Aubrey & I left UCR for Mt. Baldy, Los Angeles Co., Calif. We reached the ski lifts at the end of the road at 0710. We were following up a report that gravid Sceloporus graciosus had been seen there the week before. This particular area was still in shade at this time, so we dropped down to a lower elevation. We found Sceloporus occidentalis and Uta stansburiana quite common in a stream bed at 4700 feet elevation. However, most of the animals we caught were ♂♂. Frank caught a young Crotalus viridis in the

Mayhew 1958

Aug. 1 Mt. Baldy, Los Angeles Co., Calif. stream bed about 50 feet from the road. At approximately 1000 we headed back up the slope, stopping at Glacier Campground for lunch (5475 feet elevation). After lunch we captured both Sceloporus graciosus and Sceloporus occidentalis as well as Cnemidophorus tigris. In fact, one of the largest Cnemidophorus I've seen was captured here. Again, nearly all the Sceloporus we caught were ♂♂. These animals were still active on the sunny rock surfaces until we left at 1330. By then it was too late to go to the top of the road, so we returned home. We found it is approximately 40 miles from UCR to the end of the road on Mt. Baldy.

Aug. 5 Colorado Desert, Calif. Dr. Dean Parker (our new chairman), Frank Awbrey & I left Riverside at 0415 and drove to the future site (we hope) of our desert research area near Palm Desert. We reached the area about 0545 and observed the canyon from above. Uta stansburiana and Cnemidophorus

Aug. 5

Colorado Desert, Calif.

tigris were already active when we arrived. We drove into the area about as far as the car would go, then walked into the mouth of Deep Canyon for about 1/4 mile. By this time (0800) only Uta were seen moving, and not many of these. One Uta mearnsi was seen about 20 feet above the canyon floor just inside the mouth of the canyon. The remains of an adult Sauromalus obesus was found at the same place in a crevice about 10 feet above the floor. Water had come down the canyon from last week's rains, so there were still damp spots in depressions near boulders in the stream bed. Fresh mountain sheep tracks were seen in nearly every one of these damp depressions, but we saw no sheep. Ocotillo are again in leaf in this area, and Beloperone is in bloom. Some new leaves were also seen on the palo verde. Nearly all of the perennials are quite green. We then proceeded down highway 99 past the Salton Sea to highway 78. San Felipe Creek had water flowing under 99, but not under 78. However, one could see where it had been flowing quite recently there.

Aug. 5

Colorado Desert, Calif.

In fact, a depression beside the San Felipe Creek bridge on highway 78 still contained water. It didn't appear that these rains had caused very much erosion in the bed. We returned to Riverside (via Warners Hot Springs) at [redacted] 1545.

Aug. 22

Tonight at 2045 Mark Kohn, Bill Light, Ed Cowan & I headed for the Colorado Desert. We reached Scissors Crossing about 2330 and drove down the road towards Vallecito (night collecting). We returned to Scissors Crossing after driving a couple of miles, however, because we were getting low on gas. (Forgot to say we caught 2 _Bufo_ sp. on the way down: 1 caught by irrigated field 3 mi. north of ~~[illegible]~~ Surprise Summit, San Diego Co., Calif., the other 1 mi. south of Warners substation, San Diego Co., Calif.) We tried to collect as we proceeded toward Brawley, Imperial Co., Calif. for gas. A young _Dipsosaurus dorsalis_, 2 young _Phyllorhynchus decurtatus_ & a _Coleonyx variegatus_ were caught on the

Aug. 23

way (data in collection notebook). After getting gas in Brawley at 0415, we headed east toward Glamis, Imperial Co., Calif. We slept for a couple of

Aug. 23

Colorado Desert, Calif.

hours, then drove down the newly paved road through the sand hills from Brawley to Glamis (opened last week). We stopped in the dunes and caught Uma notata (young + adults) from 0730 to 0930. We then drove east on the unpaved road from Glamis to Palo Verde. We stopped + ate breakfast, then slept in the shade of some catsclaw until 1400 (approximately). We returned to Brawley, then drove west on Highway 99 to Truckhaven. After gassing up, we began night collecting along Highway 78 from its junction with Highway 99. Collecting was quite poor, so we went to bed 6 mi. South of Ocotillo Wells, Imperial Co., Calif. on road to gypsum mine + Split Mountain about 0030.

Aug. 24
[redacted]

This morning we began collecting along the road where we camped at about 0630. Large numbers of young Callisaurus draconoides were sitting on the pavement at this time, some of which we caught. Two young Phrynosoma m'calli were picked up about 20 feet apart about 0800 on this road. Later several Dipsosaurus dorsalis + Crotaphytus wislizeni were seen here, + some were collected. We left the

Aug. 24 – [redacted] Colorado Desert, Calif.

road at 1315 because all our collecting sacks were full (we found one empty one later). We stopped a few minutes in the area of Sentenac Cienega where a couple of Uta stansburiana were caught. We headed for home at 1600, and arrived about 1830. The trip was approx. 600 miles long. A total of 47 specimens of 11 species were collected on the trip.

Aug. 25-26 1000 Palms area, Riverside Co., Calif.

Frank Awbrey & I left UCR at 2235. We reached the old highway 60-70-99 about 2345 (8/25/58) and began looking for specimens on the road. Relative humidity at this time was: 41%; road surface temp. — 31°C.; soil surface temp. — 30°C.; air temp. — 30.5°C. (87°F.); wind direction — west; wind velocity — 18 mph (ranges from 11 to 26 mph); moon — 3/4; clouds — high, 5% overcast. No animals, except and occasional mouse, were seen on the old highway between Garnet & 1000 Palms, or from 1000 Palms to 1000 Palms Canyon, or return on the old highway. At 0055 and at 0105 the air temp. was 93°F.; relative humidity 33%; wind velocity & direction as before. Approximately at 0200 we pulled over to the side of the road and slept until 0445. We drove down the

Aug. 26 1000 Palms area, Riverside Co., Calif.
old highway toward Garnet until we reached the power lines of So. Calif. Edison Co. We followed the paved road that paralleles the power poles to North Palm Springs at Dillon Road, then retraced our steps to 1000 Palms. Several young animals were caught along the road shortly after sun-rise. At the time we started (0445): air temp. — 25.2°C.

surface " — 25.5°C.

Road " " — 29°C.

Rel. Humid. — 39%

The power line road is 3½ miles long from old 60-70-99 to Dillon Road. Old 60-70-99 from Garnet to 1000 Palms is 10 miles long. At 0710 we entered Ramon Road from 1000 Palms, and collected some young Uma inornata between 1000 Palms and 3 miles west. At the point 3 miles west, we entered a partly developed subdivision with paved roads. We stopped at the end of one of these roads + collected Uma inornata, Dipsosaurus dorsalis, + Uta graciosa. We left this area and drove up Highway 74 (Palms to Pines) to Mountain Center, then turned toward Idyllwild. We collected [redacted] Sceloporus graciosus 5 miles north of Idyllwild

Aug. 26 1000 Palms area, Riverside Co., Calif. then returned to Riverside at 1500. In all, we traveled 211 miles, and collected 27 specimens of 7 species.

Sept. 10 Barton Flats area, San Bernardino Co., Calif.

This morning at 0715 Warren Gross and I left Riverside for Barton Flats and the San Gorgonio Wild Area. We reached the wild area (about 50 miles away) at 0845. There is a comfortable trail leading from the parking lot over "Poop-out Hill" on toward the summit of San Gorgonio. We followed the trail for a mile or so, then dropped down into a beautiful meadow at the edge of the south fork of the Santa Ana River. Lots of birds and some squirrels were active here, but no lizards were seen, even though the weather was very pleasant. We caught one of _Sceloporus graciosus_ & saw several others of the same species upon our return to "Poop-out Hill." We didn't see any before that, however. The first lizards were seen about 1145 when the air temperature was 22.2°C. (72°F.) and the surface temperature was 33.8°C. (92.9°F.). This spot is about 8000 feet in elevation. Later we dropped down past Jenks Lake

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Sept. 10 Barton Flats area, San Bernardino Co., Calif. to the cabins along the south fork at about 6500 feet elevation. Only one lizard was seen at this spot, but the glimpse I had was so short I couldn't identify it. We captured one young of the year (S. graciosus) on the road near Jenks Lake (≈7000'). We left this area at 1450, and reached Riverside at 1510.

Sept. 18 Mojave Desert, Calif.

This morning at 0430 Dee Munro, Frank Awbrey, Fritz Zaebst, Mark Kohn and I left on a 3-day collecting trip. We drove first to Hesperia, San Bernardino Co., Calif., arriving about 0550. At that time the air temp. was 16.4°C. We caught Xantusia vigilis, Uta stansburiana, Sceloporus occidentalis, and Sceloporus magister in this area. In Stoddard Valley, north of Lucerne Valley, summer rains had produced a colorful carpet of annual flowers that were in bloom. In this location we caught Crotaphytus wislizeni, Callisaurus draconoides, Uta stansburiana, + Cnemidophorus tigris. We then drove through Barstow to sand dunes a mile north of Newberry. We reached Newberry at 1500. At that time the air temp. was 36.8°C. and soil surface temp.

Sept. 18 Mojave Desert, Calif.

was 48°C. A number of lizards were seen, but none were captured. They were all extremely wary. Uma scoparia, Callisaurus draconoides & Cnemidophorus tigris were seen. We walked around over a portion of the Amboy lava flow, but found no lizards active except Uta stansburiana. These were quite dark on the lava. We tried to find Uma scoparia on the wind-blown sand among the lava blocks, but had no luck. We saw many tracks, however. After eating supper in Amboy, we drove through 29 Palms to Garnet, then camped on the old highway between Garnet and 1000 Palms.

Colorado Desert, Calif.

Sept. 19 We broke camp at 0540, then drove to a spot 3 miles West of 1000 Palms where Frank & I had collected specimens earlier. At 0630 the air temp. was 25.7°C. the soil surface temp. was 25.6°C. Although we looked diligently for animals at this time, none were seen until 0750, when an adult Uma inornata was seen. At this time the air temp. was 31.2°C. and soil surface temp. was 36.6°C. A wind of 3 miles/hour was blowing from the north-west. The relative humidity was less than 5%. Sufficient Uma

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Colorado Desert, Calif.

inornata were collected at this location by 0915, so we left. At this time, the air temp. was 37.6°C., the soil surface temp. was 55°C. We then drove through Indio, down the east side of the Salton Sea to Brawley, then 25 miles east of Brawley to the Sand Hills (Algodones Dunes or Yuma Dunes). We reached the Sand Hills at 1430. The air temp. at this time was 40.2°C., the sand surface temp. was 50.5°C. It was still too warm for reptiles to be active, so we drove 12 miles east of Glamis to the junction of the road with the Ogilby-Palo Verde road. Then we back-tracked about a mile to a dry wash that contained many green mesquite, etc. We collected several specimens here. Among them were Uta stansburiana, Sceloporus magister, Callisaurus draconoides, Dipsosaurus dorsalis. Also seen in the area were Cnemidophorus tigris and Sauromalus obesus. We reached this area at 1550 when the air temp. was 37.8°C., & the soil surface temp. was 44.5°C. We returned to Glamis at 1745 and tried to collect Uma notata on the dunes. The sun went down at about this time. The air temp. was 34.7°C., &

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Sept. 19

Colorado Desert, Calif.
the surface temp. was 36.5°C. One adult of *Uma notata* was captured lying partly exposed on the surface. Some other adult *Uma* & many young were seen, but this was the only animal caught. Two juvenal *Crotalus cerastes* were seen during this stop. As we began to drive toward Brawley in the dark (about 1825) an adult *Urosaurus graciosa* was collected from the road (still in the dunes). A short distance further on a ♀ *Uma notata* was collected DOR & preserved for her ovaries. A little later a juvenal *Crotaphytus wislizeni* (1900) was collected on the road, followed a few minutes later by an adult *Coleonyx variegatus*. At this time (1915) the air temp. was 32.2°C., the soil surface temp. was 31°C., & the road surface temp. was 35.5°C. We drove past the dunes, & on the outskirts of Brawley we collected an adult *Bufo woodhousei* in the road. After leaving Brawley, we drove to Ocotillo Wells. We turned south at this point toward the gypsum mine to set up camp. Along this road we collected one more adult *Coleonyx variegatus* and 2 juvenal *Phyllorynchus decurtatus*. In addition, we killed one *Crotalus cerastes* at the

Sept. 19 Colorado Desert, Calif.
edge of some alfalfa fields. We stopped for the night at 2400. The air temp. was 31.5°C., road surface temp. was 32.5°C., & soil surface temp. was 29°C.

Sept. 20 We started collecting at 0700 this morning. The first lizards were seen (Uta stansburiana and Cnemidophorus tigris) at 0730. At this time the air temp. was 31.9°C., the soil surface temp. was 34°C. At this same time Mark & Fritz were capturing 3 young Phrynosoma m'calli along the edge of the road. Eventually 2 more P. m'calli were caught. By 0915, when we left for breakfast, the air temp. was 36.7°C., the soil surface temp. was 48.2°C. There was almost no reptile activity at this time (except for young Callisaurus draconoides). We returned to the same area at 1050, at which time we caught one Dipsosaurus dorsalis sitting in the shade of Larria divaricata. The air temp. waist high (the usual measuring location) was 39.2°C., air temp. 2 inches above ground was 43.5°C. The soil surface temp. was was 54°C. The Dipsosaurus was caught without any chase. The cloacal temp. taken immediately upon capture was 43°C.,

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the soil surface temp. in the shade at the point of capture was 42.6°C. An immature Crotaphytus wislizeni was captured while it was resting in a burrow (in the shade) with its head exposed. No other animals were seen, so we drove to an area 5 miles north of Idyllwild in the San Jacinto Mts. We reached the area at 1515. The air temp. was 24°C., surface temp. (in shade) was 24.8°C., surface temp. (in sun) was 40.6°C. Some Sceloporus graciosus and one Sceloporus occidentalis were caught at this location. We returned to Riverside from this site, reaching Riverside at 1740 after traveling a total of 822 miles during the 3 days.

Oct. 10 Barton Flats area, San Bernardino Co., Calif.

This morning Frank Awbrey & I left UCR at 0915. We reached the 3000 foot level in Mill Creek Canyon at 1000 (about 10 miles N.E. of Redlands). Here we worked the rocky stream bed. We caught several Uta stansburiana and Sceloporus occidentalis, and saw several more. At this time the air temp. was 30°C., the soil surface temp. (in sun) was 50°C. Most of the animals were seen sitting on the tops of

Oct. 10 Barton Flats area, San Bernardino Co., Calif.
rocks, basking in the sun. We located a rather good collecting spot for our transect work at about 4100 feet, which was 5 miles on up the Mill Creek Road toward Barton Flats. The 5000 foot collecting site, 3½ miles further up the road, and 2½ miles below Camp Angelus, doesn't look very easy to work. However, it should provide sufficient animals for our study. This spot is in rather precipitous country, compared to the 3000 & 4000 foot sites (both of which are in the stream bed). The 6000 foot site is 2½ miles above Camp Angelus, and 3 miles below the Jenks Lake turnoff. This area looks to be easy to work. We ate lunch at Barton Flats campground #2 (6260 feet elevation, about 1 mile above Jenks Lake turnoff). The South Fork campground, about 3 miles on up the road from Barton Flats campground #2, but at the same elevation, was our next stop. We collected several _Uta stansburiana_ and _Sceloporus occidentalis_ here. No _Sceloporus graciosus_ were seen, although we have several in our collection from here. The air temp.

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Oct. 10

Barton Flats area, San Bernardino Co., Calif. at this location at 1330 was 23°C. We retraced our route to the Jenks Lake turnoff, went to look at Jenks Lake, then drove the 4 miles from the paved road to Jenks Lake to the parking area at the edge of San Gorgonio Wilderness area. We looked for lizards here, but saw only one juvenal Sceloporus graciosus running about, even though the air temp. was 19°C. (66°F.) under perfectly clear skies (at 1530). At this time the wind velocity was 4 mph. from the N.W., relative humidity was 29%. The altitude is 7650 feet. We returned to Riverside from here, leaving at 1535 and reaching UCR at 1650. The entire trip covered 110 miles. The weather seemed ideal to us, and we were in good lizard country at the right time of day as far as we know. Nevertheless, few lizards were to be seen. Since S. occidentalis is found at lower altitudes generally than S. graciosus, one would believe that S. graciosus would be more tolerant of lower temp. than S. occidentalis. However, we saw only adult S. occidentalis, even above 6000 feet.

Oct. 16 1 mi. N. of Newberry, San Bernardino Co., Calif.
Frank Awbrey & I left UCR at 1920 this evening, headed for Newberry. We drove through Hesperia to Lucerne Valley, then through Stoddard Valley to Barstow, Daggett and Newberry. We reached Newberry at 2215 (a trip of 3 hours), after driving 124 miles. We camped just west of Mt. View Road.

Oct. 17 This morning we arose at 0700. At this time the air temp. was 17.2°C., the surface temp. (shade) was 12.5°C., & surface temp. (sun) was 17.8°C. The altitude is 1725 feet. We walked through & around dunes that mostly were covered with mesquite. There was a fair amount of mistletoe scattered through the mesquite. This area is one mile north of Newberry on Mt. View Road. No lizards were seen until 0755. The first lizard caught (imm. Uma scoparia) was taken at 0825, and was the second lizard seen (the first one also was a young Uma scoparia). In all, only 4 lizards were caught at this location: 1 Uma scoparia, 1 Callisaurus draconoides, & 2 Cnemidophorus tigris. We saw only two or three lizards that we didn't catch. For some reason, very few lizards were active, even though the temp. was warm. When we left at 1040, air temp. - 31.3°C., soil surface temp. 42°C. (Barometric pressure - 28.1 inches).

Oct. 17 10 mi. E. of Newberry, San Bernardino Co., Calif.
When we left Newberry, we traveled east to the lava beds produced by Pisgah Crater. We reached there about 1125. We caught a total of 8 lizards here: 1 Phrynosoma platyrhinos, 1 Uma scoparia, 1 Cnemidophorus tigris, 4 Uta stansburiana, & 1 Urosaurus graciosa. The air temp. upon our arrival was 32.2°C., the soil surface temp. was 47.8°C. Nearly all the animals were caught on the sand between the lava outcrops, but a couple of Uta were caught on the lava. For the amount of territory we covered, we saw relatively few reptiles. We left the area at 1245 when the air temp. was 36°C., & the soil surface temp. was 48.5°C.

6 mi. S. of Barstow, San Bernardino Co., Calif.
We stopped at the Stoddard Well Road and walked around the area from 1445 to 1530. Although the area had received heavy rains this summer (judging from the newly washed gulleys), and the creosote bushes were in fine shape (some are setting seeds now), not a reptile was seen the entire time. Temps. when we left were: air - 32.4°C., soil surface - 34.2°C. One Uta stansburiana was caught a little later (1645) five miles farther south. By this time the sun was nearly ready to set. We drove through Lucerne Valley, Hesperia,

Oct. 17 10 mi. E. of Phelan, San Bernardino Co., Calif.
and across Highway 395 to we were 10 miles east of Phelan, where we camped for the night on a dirt road that ended about 1/4 mile south of the paved road to Phelan. We drove a total of 118 miles today.

Oct. 18 This ~~morning~~ we arose at 0700 and ate before looking for lizards at 0745. At this time the air temp. was 25.7°C., soil surface temp. was 29.2°C. Although we walked a considerable distance among the Joshua trees and junipers, we didn't see a single adult Sceloporus magister, + only one young one. Other lizards seen were: Sceloporus occidentalis, Uta stansburiana, Crotaphytus wislizeni. We worked this area until 1000, then started driving toward Phelan. We saw several lizards on tree trunks and telephone poles as we drove slowly along, so we stopped and caught several in this manner. The reason we saw several was probably a combination of warmer temp. (29.3°C. air temp.) and covering a greater area than previously. We drove down one dirt road to see if collecting from the car by driving slowly would be efficient. We are convinced it

Oct. 18 East of Phelan, San Bernardino Co., Calif.
would be better than walking through an area. We had to return to UCR before noon, so we hurriedly drove through Phelan on Sheep Creek Road to reach the Cajon Junction–Palmdale road (Highway 138). At the junction of highway 138 and Sheep Creek Road is a beautiful valley full of Joshua trees and junipers that might be ideal *Sceloporus magister* country. We plan to look it over next spring. We reached UCR at 1205 after a total trip of 295 miles for the 2½ day period. We plan also to return to our campsite of last night to see if more animals are present there next spring. This spot is just west of two rows of major power lines leading to Los Angeles. The entrance to the road is 0.2 mile west of the power lines, and is the 2nd dirt road to the left. The 1st dirt road is a small, windy one that travels beside the power lines.

Oct. 24 1000 Palms, Riverside Co., Calif.

This morning at 0635 Dee Munro, Frank Awbrey & I left UCR for the area around 1000 Palms. We reached the first collecting site,

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Oct. 24 1000 Palms, Riverside Co., Calif.
about 4 miles west of 1000 Palms, at 0745. This site is 65 miles from UCR. It started to rain at 0755 while we were unloading our equipment. It stopped raining at 0800 after a fairly hard shower. The sandy surface of the area was damp 1 cm. below the surface layer. Just before the shower the air temp. was 19°C. & soil surface temp. was 20°C. The sky was about 80% overcast at the time. At 0815, just after the shower, the air temp. was 20.7°C., the surface temp. was 21°C. At 2 cm. below the surface (1 cm. beneath the damp layer), the temp. was 20.5°C., and 12.5 cm. deep the temp. was 24.5°C. Two juvenal Uma inornata were seen & captured at 0825. At 0840 an adult Uma inornata was seen sitting in the sun at the base of a creosote bush. Two other adults were caught a little later when they were seen on the surface. One other one was stirred out of the sand at the base of some vegetation. We decided to see what animals might be out on "Granddaddy Dune" along the old Garnet-1000 Palms highway. We reached this site at 1010. Altitude

Oct. 24 1000 Palms, Riverside Co., Calif.

at the base of the dune is 600 ft. We caught the remainder of our desired sample of Uma inornata at this site. Some were seen on the surface, but most were dislodged from the sand at the base of vegetation. Most of them were found in the sand at the base of an annual on the lower edge of the dune on the lee side. When a lizard was dislodged from its hiding place, it nearly always headed for the nearest creosote bush, which was never far away. The only other animal seen at either of these sites was a juvenal Phrynosoma platyrhinos at the base of "Granddaddy Dune." We stopped our search and ate lunch at 1200, then drove to the future desert research station (we hope) at the south side of Palm Desert. We reached the southern end of the road into the area at 1325. (It is 14 miles from "Granddaddy Dune" to Palm Desert turn-off to the station, another 6 miles to the end of the road in the station.) A few moments after getting out of the station wagon it began to rain, but it didn't last long. We walked a mile

Oct. 24 Palm Desert, Riverside Co., Calif.
or so up Deep Canyon looking for Uta mearnsi. We saw only one near the entrance to the canyon. It was sitting in the open on the shady side of a rocky cliff. The sun had not reached these rocks yet today. The time was 1400, the air temp. was 22.8°C., and the rock surface temp. was 23.8°C. Even though we searched both shady and sunny areas (the sun shown brightly after the shower) no other Uta mearnsi were seen. The only other lizards seen on the research area were Uta stansburiana and Cnemidophorus tigris. Although no rains had fallen in this area recently, judging by the soil condition, considerable water had flown down the stream bed recently, and the stream bottom was still quite moist in most spots. We left Palm Desert at 1615 and returned to UCR. We hit rather heavy rain in Beaumont and the Badlands, so we didn't reach our destination until 1755. (It is 73 miles from Palm Desert to UCR.) The total trip covered 174 miles.

Oct. 25 Stoddard Valley, San Bernardino Co., Calif.
Jean Coulson returned from this

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Oct. 25 Stoddard Valley, San Bernardino Co., Calif.
area today with a report that heavy rains this past week have made deep gullys in the road to Stoddard Well, as well as cover some of the paved road from Barstow to Lucerne Valley with dirt. She found one of the desert tortoises we marked and released last May in this area. It was 200-300 yards away from the release point, and was digging a burrow. The 1st scale to the left of the head was the one that was marked. This would make it # 3 . No lizards were seen there.

Oct. 30 5 mi. W. of Glamis, Imperial Co., Calif.
Frank Awbrey & I left UCR at 1955 for the Glamis area. We reached the desired area at 2320 after a trip of 170 miles. The area is 22.5 miles from the eastern city limits of Brawley and 17 miles beyond the Glamis turn-off from the road to Holtville. It is also 2 miles east of the divided bridge over the All-American Canal. During the night, the minimum temp. recorded on the maximum-minimum thermometer was 51°F.

Oct. 31 This morning we began work at 0900. at this time the wind was from the N.E. and ranged from 10-14 mph.

Oct. 31

5 mi. W. of Glamis, Imperial Co., Calif. The air temp. was 22.6°C., the soil surface temp. was 31°C., the relative humidity was 55%. Young <u>Uma notata</u> were on the surface basking at this time. No adults were seen on the surface until 0942 when the soil surface temp. was 35°C. There are a tremendous number of young in this region now. Not too many adults were seen, and those that were seen usually were successful in reaching a burrow before we reached them. However, a few large specimens were captured. Three adult of <u>Urosaurus graciosa</u> also were caught. These were either on the ground beneath vegetation on the sand dunes or else were on the vegetation itself. We found most of the animals at the base of steep dunes on the lee side. Vegetation is reasonably abundant in this location, and several times we found at least a dozen animals around a single large piece of vegetation. We returned to the car at 1245 and left the area at 1320. The maximum temperature recorded for the day was 84°F. The sky was almost completely overcast by the time we left;

Oct. 31 | 5 mi. W. of Glamis, Imperial Co., Calif.
although no clouds were present when we got out of bed. On the return trip we obtained some mileage measurements between areas that we pass quite often. They were:

Brawley – Highway junctions 78 + 99 – 25 mi.
Highways 78 + 99 — Truckhaven — 14 mi.
Truckhaven – Indio — 33 mi.
Indio – Riverside — 74 mi.

We reached UCR at 1705 after a total trip of 349 miles.

Nov. 13 | Frank Awbrey + I left UCR at 1905 this evening for Glamis. We reached our campsite at 2230. The altimeter read 390 feet this time. The road temp. was 16.4°C., the soil surface temp. was 14°C., the air temp. was 17.8°C., relative humidity was 55%, there was no wind. During the night the minimum temp. was 8.9°C. (48°F.).

Nov. 14 | We arose at 0830 and began looking for lizards at 0930. The weather conditions at 0830 were:

wind — from S.E. at 3-5 mph.
air temp. — 17.8°C. (64°F.)
Surface temp. — 23.4°C.
Road temp. — 20.8°C.
Rel. humidity — 53%

By 0900 the wind had increased to 6-9 mph., where it remained the rest of

Nov. 14

5 mi. W. of Glamis, Imperial Co., Calif.
the time we were in the area. At 0915 I took a humidity reading with the Serdex hygrometer on the sand surface. It read 49%. The humidity in a newly dug hole in the sand (20" deep) was 61%. The sand was quite damp from about 6" deep on down. The first animal seen was a juvenal *Uma notata* about 50 feet from the car. The first adult *Uma notata* was seen at 0945. Except for an adult *Coleonyx variegatus* found on the sand dune under an old automobile seat, no other reptiles were seen (other species). A few adults were seen and caught, but the great majority of the active animals were juvenals. However, adults were still active at 1315 when we stopped looking. At this time the weather conditions were as follows:

Air temp.— 25.6°C.
Surface temp.— 36.8°C.
Wind — S.E., 6-9 mph.
Rel. humidity — 39%.

[Maximum temp. today was 26.7°C. (80°F.)]

We weren't able to leave the area until 1440 because the road beside us was blocked off for photographing Buick TV commercials. When we were permitted to move, we drove to the

Nov. 14 5 mi. W. of Glamis, Imperial Co., Calif.
top of the highest dune. From here we were able to see Brawley & much of the rest of the Imperial Valley, Glamis, the road through the Chocolate Mts. to Blythe and the Cargo Muchacho Mts. to the S.E. It was quite an impressive sight.

San Felipe Hills, Imperial Co., Calif.
After we left the Glamis area, we stopped along highway 99 opposite these hills to see if there was any evidence of *Uma notata* living here. The wind was blowing fairly hard, & it was almost dark, so we didn't learn anything definitely. However, there are numerous sandy areas that could possibly support *Uma*.

4.5 mi. W. of 1000 Palms, Riverside Co., Calif.
We set up camp at the abandoned filling station on the old highway between 1000 Palms & Garnet at 1930. At this time the wind was blowing from the west at about 22 mph. with gusts to 30 mph. The air temp. was 17.8°C., rel. humidity was 57%.

Nov. 15 We arose at 0830 and found the wind still blowing like mad, although not as hard as last night. It was still from the west at 10-15 mph. with gusts to 19 mph. The minimum temp. last

Nov. 15 4.5 mi. W. of 1000 Palms, Riverside Co., Calif. night was 11.1°C. (52°F.). This morning at 0830 the air temp. was 13.4°C., the soil surface temp. was 18.5°C., the rel. humidity was 42%. As it was so windy and cool out, we didn't leave the car to look for animals until 1030. (altitude according to altimeter here at "Granddaddy Dune" is 810 feet.) At this time the air temp. is 14°C., soil surface temp. is 21.4°C., rel. humidity is 38%. Sand on the lee side of a dune, however, has a much higher temp. For example, at 1050 we measured air + surface temp. on the S.E. side of a dune that is about 6' high and covered on top with creosote bush. The air temp. was 18.6°C., + the surface temp. was 41.8°C. Only 2 lizards were seen while we were looking - both juvenal *Uma inornata*. They were on the surface on the lee side of their respective dunes. The first was seen at 1100, the second at 1140. The weather was so bad + the lack of animals so discouraging, we quit looking at 1145. We probed as much as 4 inches below the sand under many bushes without finding a thing. We reached UCR at 1305 after a total of 351 miles covered on the trip.

Dec. 13 UCR campus, Riverside Co., Calif.
Today Frank Awbrey & I took turns making observations from the blind on A area at the south edge of the campus. We were looking for Sceloporus orcutti; but didn't see any. The only animals seen were: Uta stansburiana
Calif. quail
Mockingbird
Sparrow hawk
Brown towhee
Canyon wren
Red-shafted flicker
The day was very pleasant and warm (maximum air temp. was 84°F.).

Dec. 18 5 mi. W. of Glamis, Imperial Co., Calif.
Frank Awbrey & I left our house at 2125 and drove to our collecting site in the Yuma Dunes. We reached our campsite at 0050 (12/19/58) after an uneventful trip of 176 miles. The minimum temp. tonight was 44°F. The weather was calm and clear.

Dec. 19 We arose at 0915. We took our time breaking camp because it was too cool for reptile activity yet. (Gravel trucks kept us awake from 0600 on.) We began looking for reptiles at 1050. The first lizard seen (young Uma notata) was spotted at 1119. At this time, the air

Dec. 19 5 mi. W. of Glamis, Imperial Co., Calif.
temp. was 20.6°C., soil surface temp.-32.5°C.
Two juvenal *Uma notata* + 1 adult ♂
Urosaurus graciosus were all the
animals that were caught today. Another
half dozen young *Uma* were seen, but no
adults were seen at all. We took a
break for chow at 1330 and resumed our
search at 1430. No reptiles of any kind
were seen on this trip. A large number
of house finches + quite a number of
audubon's warblers were seen, however.
One burrowing owl was also seen. We
collected specimens of all the plants
growing in the area + returned to
the car at 1545, slightly over 1 hour
before sundown. The maximum temp. today
was 79°F. We drove to the abandoned
gas station on the old highway between
Garnet + 1000 Palms (7 mi. west of
1000 Palms) and camped for the night.
We reached this area at 1945. The minimum
temp. recorded tonight was 46°F. The sky
became partly overcast, but no wind blew.

Dec. 20 5 mi. W. of 1000 Palms, Riverside Co., Calif.
We arose at 0810. We waited until 1035
to begin looking for lizards because it
was too cool for them to be out earlier.
At this time; air temp. was 18°C.
soil surface temp was 26°C.
relative humidity was 28%
wind — none
thin cloud cover ~ 80% of sky.

Dec. 20 5 mi. W. of 1000 Palms, Riverside Co., Calif.

No reptiles + no reptile tracks were seen while we were out this morning. We collected a few plants + returned to the car at 1130 to fix chow. At this time: air temp. — 21.8°C.
soil surface " — 34°C.
wind — S, 5-7 mph, gusts to 8 mph.
relative humidity - 32%

Two rock wrens were seen along the road while we were eating lunch. We left the car at 1230 and retraced our route over the north east side of "Granddaddy Dune". At 1230, air temp. was 21°C., soil surface temp. was 36.2°C. No reptiles were seen on this trip, + no fresh reptile tracks were seen. One flock of house finches was seen. We reached the car at 1330, when air temp. was still 21°C., + soil surface temp. was 36°C.

We stopped in Rancho Mirage for a few minutes to see Lloyd Tevis. He showed us some sand dunes on the north side of Palm Desert that I didn't know about before. These dunes are due north of Portola Ave., and about 2 miles north of Highway 111. No animals were seen (except 1 jackrabbit), but the area looks promising. To reach it, we turned east off of

Mayhew
1958

Dec. 20

Palm Desert, Riverside Co., Calif.
Rio del Sol Road on Clavey Lane (just north of Whitewater River channel). A dirt road to the left leads away from Clavey Lane about 1 mile from Rio del Sol (Palomino Drive goes right at the same spot). By following this dirt road 1½ miles, one reaches the dunes. We returned to UCR from Palm Desert, reaching UCR at 1640. The entire trip covered 398 miles.

It was obvious that adult Uma in both our collecting areas are not at all active at this time of year (at least, not this year). The weather was as fine as one can expect at this time of year, so if they are ever active at this time, one would expect them to have been active this time. The adult Urosaurus this trip was a surprise, since we didn't expect any of them to be active yet.

Mallard

Mallard

Mayhew
1947

Mar. 15 Lake Merritt, Oakland, Alameda Co, Calif.

At 10:30 A.M. a ♂ and 2 ♀ were seen feeding about 30' away. The ♂ had a beautiful green head predominant. Both sexes had reddish-orange legs. When feeding, they stand on their heads, feet waving continually to keep them in that position. They averaged about 4 seconds under water.

1949

April 25 Conway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

One nest was found in a dry tule area, in which the tules averaged about 18 inches in height. The nest was placed in a clump of these tules, + was rather well concealed. The nest contained 8 eggs. The ♀ flushed from the nest when we were about 20 feet from the nest, but she remained in the area.

May 7 Today 172 ~~breeding pairs~~ drakes were counted on the ranch west of the main canal that passes just east of the headquarters buildings. The males still seem to protect their territories from invasion by other pairs, since a number of instances were seen where a ♂ was chasing a pair away from an area, + then he would return to the same place.

May 14 Today 260 ~~breeding pairs~~ drakes. were seen in the same area that was covered last week. On several occasions 2 or more males were seen swimming in very

Mayhew
1949

May 14 Conway Ranch, 2 miles east of Woodland, Yolo County, Calif.

close proximity to one another. This wasn't seen last week, so apparently the territories are not being defended as much as before. On one occasion, 10 males were seen pursuing a single female. The entire procession dropped to the south bank of the drainage ditch at the south end of the ranch. Very shortly, however, the birds again rose singly + in pairs, but the female did not rise while I was watching.

May 22 In a flooded rice field, 11 males were seen in a rather loose group in one rice check. In addition, one pair of ducks were seen within 50 yards of this group of drakes.

A hen was flushed from a ditch bank (south side) about 100 yards west of the end of a row of trees (2 rice levees from the trees), which was near a tule swamp just east of the main canal. She had laid one egg at the spot, but there had been no nest construction whatever. The egg was lying on the ground, surrounded by fairly high weeds (24 inches average height). The egg was warm to the touch, as though she had been sitting on it, but not as warm as a newly laid egg usually feels. She didn't circle the area as these hens usually circle their nests when disturbed,

Mayhew
1949

May 22 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

but flew off out of sight without making even one circle of the area.

June 4 About 3 PM I saw a ♀ fly up from a barley field, & on checking the area from which she flushed, I found her nest.

① I probably would have missed it, but for the fact that the ducklings in the nest peeped several times, giving me a clue as to the location. Except for one

[1] head sticking out, all the ducklings (6 in number) were completely covered with a mixture of duck down & fine grass. The nest, made directly on the ground, was profusely lined with down. The nest was located about 50 yards from a ditch on the south & about 150 yds. from a ditch on the west. The young were less than a week old; the remains of 2 eggs were still in the nest. The barley around the nest averaged about 24 inches high. One of the ducklings left the nest when I uncovered it, but upon being returned to the nest & re-covered, it remained quiet. Most of the ducklings were lying on their sides when I uncovered the nest, but they didn't seem to be bothered by my intrusion. They merely blinked their eyes & remained on their sides until I covered them again. Just as I was leaving the nest, the ♀ returned, made one wide circle of the area,

Mallard

Mayhew
1949

June 4 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
then flew off, accompanied by the ♂, beyond the ditch to the south. I didn't see her again before I left the area.

June 5
(2) About 11 A.M. I flushed a ♀ from the shore of a small pond in the middle of a barley field. She flew about 10 feet from the nest & settled on the pond. At my approach, she took off & flew in wide circles around the pond. The nest, containing 5 eggs, was composed of the dry sedge grass in which the nest was located. The grass was very dense around the nest. There were less than a dozen down feathers in the nest at this time. The nest was well concealed by the grass growing over & around it.

[2] About 2:30 P.M. a hen with 7 young were seen in a drainage canal between 2 large barley fields. The young appeared to be out of the nest just a short time. The ♀ led them into a patch of tules & disappeared.

(3) Another nest was found in the same grain field that #1 is located. It contained 4 eggs. The nest consisted of about ½ down, ½ barley straw. The growing barley was well arched over the nest.

(4) The next nest had 2 mallard eggs & 1 pheasant egg in it. The ♀ Mallard was flushed from the nest. The nest was composed of down & barley straw.

Mallard

June 5 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
(5) The next nest contained 5 eggs, & had a profuse amount of down in its construction.
(6) This nest contained 6 eggs & also had a profuse amount of down. These 2 nests were about 50 yards apart.

June 11 This nest contained 2 eggs & one newly
(3) hatched duckling. There was no evidence of
[13] the 4th egg. There was very little down in the nest, and there was no covering over the youngster.

(7) Another nest was found along the ditch bank beside the large barley field, just at the end of the tall weeds. There were 5 eggs in the nest, but no down. The ♀ flushed & dropped into the ditch about 10 yards away. There she threshed back & forth in the water. Then she led me down the ditch about 150 yards before she left me to return to her nest. She kept a distance between us at all times of about 20 yards all the way down the ditch.

(4) There are still 2 duck eggs in the nest, but the pheasant egg disappeared without leaving a trace. I searched the entire area around the nest for it without success. The ♀ dropped in the ditch & attempted to draw me away with loud quacks. She stayed within 15-20 yards of me while I stood motionless on the

Mayhew
1949

Mallard

June 11 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
bank. As soon as I began walking, she
swam ahead of me.
(6) At about 6:15 A.M. I reached this nest, only
to find it deserted. The young were about
20 yards from the nest, heading for the
canal about 40 yards away. In the tall
grain I was unable to catch any of them,
but I could tell there were several by
the peeping at several places in the grain.
They continued toward the ditch, with
the ♀ circling closely, trying to draw me
away. The nest had only a small
piece of one eggshell remaining in it, so
[4] I assume all 6 eggs hatched successfully.
In about 5 minutes one of the young
joined the ♀ in the canal. They swam
back & forth with the youngster making
peeping noises quite frequently & loudly.
About 5 minutes later another youngster
joined them. About this time I flushed
another ♀ about 30 yards farther on, but
could find no trace of a nest. However,
(5) I had marked a nest about 50 yards
south of #6, & upon arriving at it,
I found the young had gone. They could
be heard in the barley, so I assume
the ♀ I flushed was leading her brood
to the canal when I disturbed her. In
the abandoned nest was one egg that
hadn't hatched, 1 egg in which the youngster

Mallard

Mayhew
1949

June 11 Conway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
was about ready to hatch, but for some reason didn't (there was a hole in the side of the shell), + 1 young dead duck with the side of its head caved in.

By ~~[illegible]~~ crouching beside the canal in the weeds, I saw the 1st ♀ flushed with young leave her 2 youngsters in the canal + fly back into the edge of the barley field, apparently looking for the rest of her brood. I waited for another 10 minutes, but the ♀ didn't return to the 2 young in the ditch. When I left, the 2 were swimming north along the canal, still peeping loudly.

(8) I found an abandoned nest with 7 mallard eggs, + 1 pheasant egg. 2 of the duck eggs had been broken, the rest were in an early stage of development when abandoned, a laboratory examination disclosed. The pheasant egg was much more developed than the accompanying duck eggs.

Another ♀ was flushed, but I could find no trace of a nest, although she circled me as if she had one in that vicinity.

[5] A ♀ with 7 half-grown youngsters were startled away from a bank of a canal out into midstream, where the young really moved through the water. They were swimming, with the aid of their wings, faster than I could walk along

June 11 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

the bank. The ♀ stayed behind, flopping her wings & trying to get me to follow her. The young finally hid in the bushes ahead of me, & I was unable to scare them out again. When the ♀ decided I was far enough from her brood, she flew out into a rice field.

(2) Upon returning to this nest, I found things just as before — still 5 eggs, with a little down around the top of the nest.

A dead ♂ was found along a ditch bank. The head had been severed from the body, but I could see no way of determining the cause of its death, as it had been dead for quite a period of time.

June 12 This morning I found a nest with 5 eggs

(9) in it. There was no down in the nest. It was very flat with little barley straw on the bottom. The nest was 20 paces west of a flag on the ditch bank.

(10) Another nest was found about 50 yards from #9, from which the young had departed. Left in the nest were 2 Mallard eggs & 1 pheasant egg. One duck egg was well on the way to maturity, the other one was unfertilized. The pheasant in the egg had already developed downy plumage. The nest was quite exposed, there being very little barley around the nest.

[6] About 8:30 A.M. I came across 2 broods

Mayhew
1949

June 12 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
[7] of half-grown ducks. Each brood had 6 young. Apparently they had been together when I came upon them. One brood swam in one direction, the other brood in the other direction. Both mothers threshed wildly about in the water to distract me. The young swam about 40 yards in each direction, + then hid in the tules. One ♀ circled the area, while the other one hid with her brood.

June 15 Today I rode a grain harvester in a barley field to learn how many nests are destroyed by the harvest.

(12) One nest was uncovered that contained 6 eggs. There was no cover around the nest after the harvester passed over.

(13) This nest was destroyed by a wheel of the harvester. It contained 6 eggs. There was little down in the nest. The ♀ was flushed from the nest by the harvester.

(14) This nest was also destroyed by a wheel. The ♀ was flushed from 9 eggs.

(15) A ♀ was flushed from this nest. There was 1 egg + 2 dead young in the nest. There was also profuse down in the nest.

(16) This nest contained 8 eggs. There was

Mayhew
1949

Mallard

June 15 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
no down except for about a dozen feathers. The stubble was about 1 foot high around it. The next trip around the field, the harvester nearly completely covered the nest with barley straw.

One old nest was found from which the young had hatched & left the nest. There was no evidence of unhatched eggs.

One egg was found lying in the open on the ground. There was no evidence of a nest near-by.

Another old nest was found with 1 youngster dead just emerging from the egg. The rest of the young had left the nest.

One dead ♀ was found. She had been partly eaten. As she had been dead for some time, there was no way of telling what had happened. There was no evidence of a nest near-by.

June 18
(16) This nest had disappeared — I could find no trace of it. Either someone moved the stake or removed the nest entirely.

(12) This nest still had 6 eggs, but it appeared that no duck had returned to it since the barley was harvested. I opened one egg, but could find no embryo. The egg appeared to be fairly fresh yet, however.

(17) A nest with 9 eggs & profuse down. The eggs were warm, so the ♀ must have

Mayhew 1949

Mallard

June 18 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
just left the nest for a short time.

(18) A female flushed from a nest that contained 7 eggs. A tractor track smashed all but 1 of the eggs on the next round.

(19) I found the remains of a ♀ about 5 feet from her nest, which contained 6 eggs. 3 eggs were intact, 2 were broken, & 1 was cracked. The young in the eggs had downy feathers already developed.

June 19 The ♀ had deserted this nest. The 5
(2) eggs were still in the nest, but they were cold. The embryos were just beginning to form.

(20) A nest with 5 eggs that had been eaten was found in the grass along a ditch bank.

(3) The eggs in this nest had hatched, leaving no eggs intact — apparently all had hatched.

(7) This nest was uncovered by a "push-header" harvester yesterday afternoon. About 12:30 P.M. today I flushed the ♀ from the nest, which contained 4 eggs & was undamaged by the harvester. The hen dropped into the ditch just a few feet away until after I left the area.

(4) The eggs had hatched & the young had gone. There were no eggs remaining.
The remains of a ♀ were found

Mayhew
1949

June 19 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
at the edge of a barley field along a ditch bank. One egg was also found there, but there was no indication of a nest. She had been almost entirely eaten quite a while ago.

A pair of ♀ were flushed from a ditch bank, but I could find no trace of any young. The females left the area entirely.

(21) A nest made of profuse down was found on the top of a ditch bank. All the eggs apparently had hatched.

(22) A nest was found along the top of a ditch bank. The 6 eggs had been eaten.

(9) This nest had been deserted, although it hadn't been uncovered by the harvester yet. 2 eggs were broken, 3 were intact. All of them had begun development.

June 21 I rode a harvester all day today.

(17) This nest had been found by some predatory animal, as all the eggs had been eaten — just parts of the shells remained.

(23) A ♀ was flushed from a nest in the tall grass along the top of a ditch bank. The nest had 8 eggs in it. The ♀ dropped into a ditch about 30 feet away from me.

(24) A ♀ flushed from a nest that held 2 eggs.

Mayhew
1949

Mallard

June 21 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
The nest was uncovered, but was undamaged by the harvester.
An egg was found out in the open, & contained a young duck about ready to hatch. The egg was broken.

(25) A ♀ was flushed from a nest that had 7 eggs in it. It wasn't damaged by the harvester. It is about 30 yds. SE. from (24).

(26) A ♀ was flushed from a nest with 8 eggs in it. The nest was about 40 yards SW of (25), 50 yards SW of (24). It was undamaged

(27) A ♀ was flushed from a nest with 8 eggs. The nest was completely exposed, as the barley was cut there yesterday. The nearest cover was at least 300 yards away. She dropped into the stubble about 60 yards from the nest, & acted as though a wing was broken. As I approached nearer to the nest, she flew to a ditch about 300 yards away.
A harvester operator said that the ♀ on nest (7) flushed from the nest again today as he cut barley near-by.

June 23 Today I found a nest that had been
(28) exposed by a harvester yesterday. The nest was undamaged, but was covered with straw. The 7 eggs were cold this morning.
Another nest was found in the stubble with all 4 eggs eaten.

(29) A ♀ was flushed from a nest that

Mayhew
1949

Mallard

June 23 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
had 4 eggs by the harvester I was riding. The nest was undamaged.

(30) Another ♀ was flushed from a nest with 5 eggs that were nearly ready to hatch. This nest was also undamaged. It was about 40 yards SW of (29).

(31) A ♀ was flushed from this nest that contained 6 eggs. It was undamaged.

(32) A ♀ was flushed from a nest with 5 eggs in it. The nest was undamaged.

June 25

(31) 6 eggs still in nest, but ♀ hadn't returned — eggs very hot from the sun. Embryos had just begun development.

(30) 5 eggs still in nest, but one was cracked. Young almost ready to hatch when the nest was uncovered. Eggs were covered with a layer of down.

(29) All the eggs had been eaten by some animal. The nest was still intact.

(32) Still 5 eggs in the nest, but ♀ had failed to return. Embryos about 1/3 through development.

(7) This nest has been destroyed by cattle tramping on it.

June 26

(26) Eggs eaten, nest destroyed. Some egg shells 3 feet from the nest site.

(24) All but 1 egg eaten — it was covered over with down, so might have escaped detection.

(25) The ♀ flushed from the nest at my

June 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
approach. There are 5 eggs in the nest that appear to be nearly ready to hatch. The ♀ flew over & beyond the ditch that is about 100 yards west of the nest. The barley has been cut from this field since June 21st.

Today I saw the first ♂ in full eclipse plumage this year. He & his mate were in the large drainage ditch at the south end of the ranch.

June 28 (27) The ♀ has apparently deserted this nest, as all 8 eggs were very hot from being exposed to the sun (11:30 A.M.). The nest was undamaged, although 4 of the eggs had been rolled out of the nest. None of the eggs were broken.

July 2 [8] A ♀ was flushed from a plot of rice next to a canal. I could find only one youngster — about 4 weeks old — hiding in the rice. When I made an attempt to catch it, it ran over the canal bank, & swam down the canal about 30 feet, where it disappeared into the dense tules.

July 9 A nest was found on a levee between rice ~~[illegible]~~ checks. All of the eggs had apparently hatched. (SE corner of section 19)

(33) A ♀ was flushed from a nest on a levee between rice checks. The nest contained 9 eggs. The field is about ½ mile south of the old barn & windmill —

July 9 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif. it is located in the SE corner of section 19.

July 10 (23) The ♀ could be seen still on the nest. The cattle have trampled everything around the nest pretty badly, but so far have failed to hurt the nest.

July 12 (25) The ♀ flushed from the nest at my approach. There are only 2 eggs left in the nest, but I can find no trace of the remains of the others, so I have no idea what has happened to them. These 2 eggs appear to be near the hatching point. Although cattle have been in this field since June 25th, they haven't damaged the nest yet.

(23) The ♀ flushed from the nest at my approach. 6 eggs are in the nest yet, but the other 2 have completely disappeared without leaving a trace.

July 16 (33) The ♀ was flushed from her nest on the rice levee this morning. The nest still contains 9 eggs.

(23) The cattle have eaten or trampled all the cover around the nest. One egg has been broken. The ♀ has apparently deserted, since the eggs are extremely hot.

July 17 [9] A ♀ + 10 youngsters over 6 weeks old (they were as large as the ♀, but still couldn't quite fly) were seen crossing

Mayhew
1949

Mallard

July 17 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
a road & disappearing into the tules on the north side of the large reservoir just west of the dog kennels. I was able to scare 6 of the young out onto the open water while the ♀ was fluttering wildly in the road & then on the reservoir. The young would flap their wings to help them over the water, but they didn't seem to be able to fly.

[10] A ♀ and 6 youngsters as big as she was were seen swimming along the east bank of the main canal just opposite the blackbird swamp (SW corner of section 27). The entire flock swam into the tules, where the youngsters preened & stretched their wings while the ♀ swam at the edge of the tules in a watchful manner.

The remains of 5 young were found on a rice levee in the SE corner of section 19. None of them seemed to have been eaten, although the heads of all of them were missing. From the size of the remains, I would judge they had been about 1 week old. There was no evidence of a nest close by.

July 19 One youngster about 6 weeks old was frightened
[11] off a rice levee into the water. It swam ahead of me for about 20 feet, & when I tried to get close enough to net it, it dove through some vegetation & disappeared

Mallard

July 19 — Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.

I waited for over 5 minutes, but saw no more sign of it. After I returned to the car, I watched the spot for 5 min. more, but there was still no sign of it.

July 23 — A group of 15 young mallards were seen together on some open water between tules on the large drainage ditch at the south end of the ranch.

July 24 — Today 32 youngsters were seen in the same area that the group was spotted yesterday. All of them are able to fly.

July 26 — This morning I made a census on the 160 acres in the S.W. quarter of section 19. A total of 11 Mallards were found in that area. Of this

12 total a ♀ with 4 youngsters about 3 weeks old

(34) is included. In addition, one nest of 6 eggs,

(35) one nest with 2 eggs (no down), & one nest

(36) with 4 eggs were all found deserted on the rice levees of the area under observation. The total of 11 ducks for the 160 acres means an average of 0.069 ducks per acre, or about 1 duck for every 14.5 acres. The cover on the rice levees on this area consisted almost entirely of volunteer wheat that averaged about 3½ feet in height. The nearest grain field is about ——— .

In the other 160 acres that was used in the census (NW quarter of section 28) a total of 18 Mallards were seen. This section is just south of an 800 acre barley field that

July 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
has already been harvested. The cover on the rice levees on this 160 acre plot consisted mostly of volunteer sudan grass which averaged about 3 feet in height. There were no broods found in this plot, although 3 of the ♀ acted as though they had a nest or young near-by. However, the cover was so thick each time that I was unable to uncover a nest or to scare out any young. The total of 18 ducks on the 160 acres adds up to 0.1 duck per acre, or about 1 duck for every 8.9 acres. Adding the two plots together, that would be 29 ducks seen on 320 acres, or an average of 0.09 ducks per acre. This would average 1 duck for every 11 acres of rice. With approximately 5,000 acres of rice on the Conaway, the number of Mallards, judging from this census, should be about 450 ducks. I don't understand what has happened, because I saw more adults than that before nesting had really gotten underway. However, I'm not very surprised at the results, because I have been finding approximately this number of ducks in covering other rice areas since June 23rd when the grain harvest finished. At that time the reduction in the number of ducks in the area was quite evident, & has remained so. I thought all along that the ducks had moved to some

July 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
~~s~~pot I hadn't located, but I still am unable to see them in any numbers.

Aug. 4 (25) This nest was just as I saw it nearly a month ago. The 2 eggs were still there, but the ♀ had apparently long since gone. One egg was infertile + the other contained a duckling that was beginning to feather. I assume that the exposed position of the nest caused the death of the youngster rather than desertion by the ♀, since she was flushed from the nest 3 weeks after the grain had been cut around the nest. It is logical to assume that the heat of the sun beating directly on the eggs when the ♀ was off the nest could kill the young while still in the shell.

1950
Feb. 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
This afternoon I found one flock of 25 Mallards with 1 ♂ Pintail in the tules of the drainage ditch at the southern border of the ranch. The flock was made up mostly of ♂, but there were some ♀ present. There is no sign of territories yet for the birds of this flock, because the entire group flew out of sight when I got out of the car.
Farther down the drainage ditch I flushed several more in company with

Mayhew
1950

Feb. 26 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
some Cinnamon Teal. At the southern end of the main canal I found a ♂ + ♀ swimming together as though they were already paired. When they flushed, they flew about 100 yards up the ditch and landed about 30 feet from another pair, + about 100 feet from still another pair. In the air, the ♂ followed the ♀, just as is the case with paired individuals. A moment later the first pair flew on up the ditch about 50 yards farther, again with the ♀ leading the way.

Mar. 6 Four pair flushed from a long, narrow pond in a cut-over rice field. No two pair were closer than 50 yards to each other. In each case, the ♀ led + the ♂ followed. When I walked along the shore of this pond, I flushed 10 more pairs that took off singly as pairs, + 6 times I flushed groups of birds that numbered 6 or more birds to a group. Each of these groups consisted of exactly 1/2 ♂, 1/2 ♀. In addition, at the eastern end of the pond I flushed one flock of 25 birds, another flock of 30 birds. Both flocks contained both ♂ + ♀. This pond is in the S.E. section of section 19.

Another pair was flushed from the main drainage ditch at the south end of the ranch.

March 6 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
Two more pair were flushed from the large drainage ditch.

Mar. 12 2 pair were flushed from the big drainage ditch. They had been loafing together, & took off as a group. However, once in the air, they split up as 2 definite pair, with the ♀ leading in each case, & disappeared to the south. About 200 yards farther east another pair were flushed. They flew about 1/2 mile farther east & landed in a rice stubble field. In a ditch along the north-west corner of section 20, 8 pair were seen. 7 of the pair were grouped along the ditch for about 50 yards. About 150 yards farther on the 8th pair were seen. As I approached, 4 pair took off together, a few minutes later another pair took off, then 2 more pair flew away, & finally the most distant pair flew away. In every case the birds disappeared to the south. There was no doubt in my mind that all of these birds were paired, because I watched their actions with binoculars before they flew away, & although they formed a loose group, each ♂ was swimming very close to a ♀. About 300 yards farther down the ditch 2 pair & a lone ♂ were seen swimming. They all flushed at the same time & started off towards the south together, but the group broke up very shortly, with the 2 ♀ &

March 12 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif.
2 of the ♂ circling back over the area + flying off to the north. The lone ♂ disappeared to the south.

While driving along the eastern edge of section 20, I flushed 4 pairs of birds. The 2nd pair was about 300 yards north of the 1st, the 3rd pair about 150 yards north of the 2nd, + the 4th pair about 100 yards north of the 3rd.

At no time today did I see any large flock of this species.

April 2 Practically all pairs are found on territories now. I spent the day counting breeding pairs in the southwest corner of the ranch. The boundaries of the area covered were: the south + west boundaries of the ranch, the main canal on the east, + Gallup Road on the north (road just south of ranch headquarters). All the ditches were covered, except 3 that will be walked in a day or two. 76 breeding pairs were counted in this area. Of that number, 4 times I saw 1 ♂ with 2 ♀, but in each case it appeared that the ♂ was mated to one of the ♀, the other ♀ just seemed to be tagging along. Twice I saw a pair of ♂ together, once I saw 3 ♂ together, but at no time did I see any sign of mallards grouping together. The

Mayhew
1950

Mallard

April 2 — Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif. greatest concentration of pairs appeared to be in the ditches at the edge of grain fields in sections 7, 27, + 28. A number of the pairs held so tight to the territory that a car driving by them did not make fly. Others, however, took off as soon as a car came near, but usually circled the area at quite a distance. Nine pair returned to their territories almost immediatly, apparently, because I had to retrace my route on 2 different occasions, + each time, all of the pairs that had been flushed were flushed a second time from the same spots. In almost every case, the ♀ was the first to fly, followed by the ♂. The ♂ seemed to be averse to leaving the territory, but always followed the ♀. At no time today did I see any ♂ have to defend his territory. It appeared to me that there is more than enough room for territories for all the mallards that are present on the ranch without any need for overcrowding.

April 4 — Today I counted breeding pairs on all the land from the ranch headquarters north to the River Road. Then I covered all the territory east of

Mayhew
1950

Mallard

April 4 Conaway Ranch, 2 miles east of Woodland, Yolo Co., Calif. ranch headquarters as far south as Todhunter Lake (Sections 15 + 16). In addition, I walked the 3 ditches that I had not covered southwest of ranch headquarters. In these 3 ditches, I found only 6 breeding pairs, making a total of 82 breeding pairs in the area covered on April 2nd. 5 breeding pairs were seen in the area north + west of headquarters, while 18 pairs were seen east of headquarters in the area covered. This makes a total of 105 breeding pairs seen to date. On 2 occasions today, 2♂ + 1♀ were seen, but on both occasions, when the birds took to the air, the 2nd ♂ just seemed to tag along, not too close to the pair. Most of the ditches on the land north of headquarters were dry, which accounts for the small number of pairs seen on this part of the ranch.

April 10 This afternoon I covered the S.E. corner of the ranch looking for territories. Although I saw quite a lot of water that appeared to be good for territories, I counted only 4 pairs of birds. This brings the total breedings pairs counted on the ranch to 109. This means an average of 1 pair for every 172 acres.

April 26 A number of pairs were seen flying over barley + wheat fields early this morning.

Mayhew
1950

Mallard

April 26 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
They flew low over the grain appearing as though they were looking for nesting sites. The ♀ flew in the lead in all cases, with the ♂ following behind. A number of times 3 to 6 birds would be seen flying together. These groups usually contained 1 or 2 ♀ + the nest ♂. The ♂ flew along for a short distance + then dropped out, as though they were looking for their own mates. By 9. A.M. very few were seen flying. Nearly all of them were seen loafing on the flooded rice fields at this time.

April 28 At 6 A.M. I was between barley + wheat fields to see in which fields the most Mallards were searching for nesting sites. The great majority were seen flying over the wheat at the S.E. corner of the grain area (section 17). By 7:30 A.M. most of the ducks had either returned to the newly flooded fields for rice or were loafing on ditch banks that pass through the grain fields.

May 7 I spent 2 hours in the middle of the day walking through wheat fields looking for Mallard nests, but I found none. I walked a little over 2 miles in the wheat field itself. I saw only 3 Mallards fly over the area the entire time — 2 of these were ♂.

May 13 I covered another 2 miles of wheat today without a trace of a Mallard nest.

Mallard

May 13 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
I saw one ♂ flying over the grain when I first arrived, but saw no other sign of Mallards near the grain fields. A few groups of ♂, numbering from 2 to 6, were seen in the main drainage ditch + also in the fields flooded for rice, but I also saw several pairs scattered over the ranch, so I don't think all the ♀ are nesting yet.

May 14 At 4:45 A.M. I was parked beside the wheat field. (The sun arose at 5:10 A.M.) A few birds were flying over the fields when I arrived, but the number rapidly increased in about 20 minutes — just about sun-up. Birds were flying about singly, in pairs, + in groups up to 9. One ♀ + 8 ♂ were seen flying over. Of this entire group I saw only one pair land in the grain field, + these landed along a ditch at the edge of the field. By 5:45 A.M. practically all the ducks had disappeared. The great majority of the birds seen flying over this morning were ♂, I saw no single ♀, and only 3 or 4 pairs.

May 20 I covered another 2 miles of wheat this morning, looking for nests, but found none. This makes a total of 6 miles of wheat that I have walked without a sign of a nest. I saw a pair flying over the wheat for a while, then the ♀ dropped in + the

Mayhew
1950

May 20 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
♂ flew back toward a flooded field.
However, I was unable to locate her nest.
In that area the wheat is very thick +
about 4 feet high, so that one would
almost be on top of a nest before
he could see it.

[1] At 11:45 A.M. I visited the pothole 1 mile
north of the old ranch headquarters. I
found a ♀ with 8 young about 2 weeks
old. I looked around the edge of the
pothole, hoping to find her nest + perhaps
be able to tell how many eggs she had
incubated, but I couldn't find the nest.

May 30 At 4:30 P.M., when I reached the grain
fields, I saw a total of 12 ♀ flying in
out of the wheat + going to the flooded
rice fields. Therefore, I didn't walk through
the grain at this time. Every one that I
saw was flying out of the wheat fields.

[1] The ♀ on the pothole still has 8
youngsters. All of them seem to be healthy.

May 31 At 10:45 A.M. I started walking through
wheat fields + covered 6 more miles in
wheat without finding a trace of a
nest. This was still in the area where
the majority of ducks were seen looking
for nesting sites. This makes a total
of 12 miles of wheat covered without
finding a single nest + only one
young brood.

Mayhew
1950

June 14 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
① A nest was found in a cut-over grain field this morning. It contained 8 eggs + quite a lot of down. The ♀ flushed from the nest when I was about 25 feet from it. The field had been cut last Friday, June 9th. The ♀ circled the area until I left the nest site. This nest was found in a field directly west of Lee Baldock's house.

June 15 A ♀ and 7 youngsters as big as the ♀ were
[2] seen swimming in a ditch 2 miles south of ranch headquarters.

June 21 Today I rode a combine harvester while it was harvesting wheat in the area where I saw most of the birds looking for nesting sites earlier this spring. The combine operator told me that nearly all the ducks seen in the grain this year were concentrated in the southeast corner of the grain field (wheat) directly south of ranch headquarters. This was also where most of the birds had been seen looking for nesting sites. Today only 3 nests were found in the 50 acres that we covered today.

② A nest with 9 eggs was uncovered by the header. The rig was 30 ft. away from the nest when the ♀ flushed. The wheat was rather thin around the nest. The nest was about 150 yards from the

Mayhew 1950

June 21 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
nearest water. There was a fair amount of down present in the nest.

(3) A nest was found in which all but 2 of the eggs hatched. The nest was about 200 yards from the nearest water. The wheat was about average in height (about 3 feet high) & not too dense.

(4) A nest containing 8 eggs was run over by the header wheel. The ♀ flushed when the wheel was about 3 feet away from the nest. The young in the eggs were about 3/4 developed.

June 22 Today I covered another 50 acres riding a combine. Only 2 nests were found all day, & only one of these was active.

(5) A nest was found that contained the remains of 3 eggs that had hatched, & also contained 4 unhatched eggs. Young were present in all the remaining eggs, & were about 1/2 developed. The wheat cover was about average, & the nest was about 250 yards from the nearest water.

(6) A ♀ was flushed from a nest containing 9 eggs. The header was about 10 feet away from the nest when she flushed. The wheat was sparce around the nest. The nearest water was 50 feet away.

This made a total of 5 nests in 100 acres of wheat, or an average of 1 nest for every 20 acres of wheat.

July 1 [3] Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
a ♀ and 8 young about 4 weeks old were seen in the main drainage ditch forming the south boundary of the ranch. Two other ♀ were seen during the afternoon, but no other youngsters, nor any ♂ were seen.

July 19 [4] While walking rice levees this morning I saw 2 ♀, but no sign of young with them. A ♀ with 2 youngsters as large as she ~~was~~ were seen in the main ditch.

Aug. 12 This morning Lee Baldock & I flew the annual duck census on the Conaway Ranch. When we added the totals, we had counted 184 Mallards + 62 teal. The flight was made in a Piper Cub, flying 75 miles per hour at between 150 & 200 feet.

1951

May 11 Today I covered the rice areas + the ditches of the Conaway to see how many ducks were there. The rice fields have just been flooded — in fact, some were in the process of being flooded. The great majority of the ducks seen were either resting on rice levees or were seen swimming in the rice checks. A total of 225 Mallards were seen today. Of this number, 116 were ♂, 32 were ♀, + 77 were too far away to determine the sex. All the ♀ seen were closely accompanied

Mayhew
1950

Mallard

Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Summary of Field Observations

	1948	1949	1950
Territory census (pairs)	400	295	110
No. nests located	60	35	5
Average clutch size	8.4	5.7	8.2
No. broods counted	106	12	4
Average brood size	4.7	4.7	6.2
Aerial census	2,055	210	184

Crop Acreages

Crop	1948	1949	1950
Rice	3,400	5,410	2,710
Grain (wheat + barley)	4,310	1,800	5,130
Irrigated pasture	1,640	1,200	1,100
Beans	—	360	—
Corn	—	—	900
Flooded land	2,770	500	—
Summer fallow	5,500	8,350	7,780
Ditches + roads	1,130	1,130	1,130
Tule swales	55	55	55
Total	18,805	18,805	18,805

In 1949 and 1950 2,4D was used as a spray in the rice fields to control weeds. It was also sprayed in ditches leading to irrigated pastures. Cyanox was used the same years in the same areas.

Mayhew
1951

May 11 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
by a ♂. The remainder of the ♂ were seen either singly or in groups up to 5. From what I saw, I would judge the breeding population to be the same, or slightly smaller than, last year.

1952
Mar. 15 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
Almost all the Mallards seen today along the south boundary of the ranch were paired up. There was no sign of territorial activity yet, however.

April 26 Chiles Ranch, 3 mi. N.E. of Davis, Yolo Co., Calif.
One pair was seen on a small pond just west of the barn. A ♂ was flushed from a pond at the south edge of the ranch. It circled the area several times, then was joined by a ♀, & both circled until I left the pond. About 3 dozen birds, mostly ♂, were found on some rice paddies that were just being flooded at the S.E. corner of the ranch. Another pair were flushed from a drainage ditch, right beside the water tank & windmill on the eastern boundary of the ranch.
[1] A ♀ & 6 young were seen in the large drainage ditch across the road on the north boundary of the ranch. They were about .2 mile east of the ranch building. As I drove by, all of them were flattened out in the shallow water with just

Mayhew
1952

April 26 Chiles Ranch, 3 mi. N.E. of Davis, Yolo Co., Calif.
their backs showing. I stopped, backed up, but the ♀ was leading the young into the dense tules nearby so that I didn't get too good a look at the young; however, I would judge them to be a couple of weeks old.

[2] About 100 yards farther west a ♀ and 5 young were seen, + these were about the same age as the previous brood.

April 29 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

[3] A ♀ and 9 youngsters about 2 weeks old was seen in the large drainage ditch forming the southern boundary of the ranch. She led them into the tules, but pretty soon 2 of the youngsters were swimming about among the tules, but in plain sight from where I sat in the car. Shortly 3 more were seen swimming with the first 2, but no more made their appearance after that.

Several hours were spent walking through a wheat field looking for nests. No nests were found, however. The field is 1 mile long + 3/4 mile wide. Four trips were made across the width of the field. The stand of grain in the portion of the field I walked is not very good. The best grain is about 30 inches high, but a good deal of it is less than 12 inches in height. At 11:55 I took the temperature + relative humidity on the ground in some of the

Mayhew
1952

April 29 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif. better wheat that was 30 inches high. The readings were: relative humidity - 48%, temp. 21°C. Readings were then taken waist high (43 inches): rel. humidity - 44%, temp. 18.5°C. A fairly strong S.E. breeze was blowing, but the sky was clear. (at waist height, the rel. humidity dropped to 40% at first, then rose to 44% as the hygrometer cooled to the air temp. at that height.)

A number of pairs were seen today, loafing on the large ditch in the center of the ranch, on the newly flooded rice checks, or on the open water on the east side of the ranch that is now flooded from the by-pass. Not many loafing ♂ were seen by themselves.

May 1 At 5 A.M. I arrived on the large levee in the middle of the ranch to see to which grain fields the pairs would fly to look for nesting sites or to return to nests already established. Only about 2 dozen pair were seen to fly over the larger wheat fields 2 miles south of ranch headquarters. Even with the aid of glasses very few pairs were seen flying over other areas of the ranch either. On a trip to the area north of ranch headquarters to look for potential nesting sites, several broods were seen in the large east-west ditch about 1/4 mile south of the

Mayhew
1952

May 1 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
[4] Woodland-Sacramento River Road. One ♀ with
2 young about 1 week old was seen first. A few
[5] yards farther west 1 ♀ with 11 young less
[6] than a week old + 1 ♀ with 9 young about
[7] a week old were seen. A ♀ with 5 young
about 2 weeks old was seen to cross a
road + go down into the ditch. A
[8] ♀ with 6 young about 2 weeks old was
found farther west in the same ditch.
[9] 6 young were seen in the big drainage
ditch at the south end of the ranch.
No ♀ was evident — these birds were about
3 weeks old.

May 2 Mrs. Argante told me of a ♀ with a brood
of 10 ducklings about 1 week old on a ditch
at the east side of Sacramento, Calif. that
were seen today.

May 10 Vic Morejohn told me of seeing a ♀ + 6
newly hatched duckings on his place today.

May 16 Gray Lodge Refuge, Butte Co., Calif.
Today some readings were taken from
mallard nests on the refuge. John Cowan
+ Don Beechman pointed out the nests
they had located. The results were as
follows:

Nest 22 — 8 eggs; some down present;
located under a brush pile near some
willows. The ♀ had been off the nest about
40 minutes, according to Don Beechman.

Mallard

Mayhew
1952

May 16 Gray Lodge Refuge, ~~Butte~~ Sutter Co., Calif.

Relative humidity — 31%
Temperature — 27°C.
Air R.H. — 31
Air Temp. — 28°C.

Nest 17 — 5 eggs; some down present. This nest was beside the road in volunteer grain about 30" high. A pond is about 50 yards away. The ♀ flushed as we arrived.
R.H. — 28%
Temp. — 31°C.

Nest 21 — 8 eggs; no down. The ♀ flushed at our arrival. Nest is in cover at side of road.
R.H. — 33%
Temp. — 32°C.

Nest 13 — 9 eggs; some down. This nest is about 15 feet from nest 21. The ♀ was gone when we arrived.
R.H. — 26%
Temp. — 34.5°C.

Nest 11 — 7 eggs; some down. The ♀ was flushed, + the reading taken within 30 seconds of her flushing. This nest is on the ditch bank just west of refuge headquarters. The weeds forming cover are growing rather densely + about 36" high. A road that is used a great deal passes within 10 feet of this nest.
R.H. — 30%
Temp. — 33°C.

Mayhew
1952

May 16 Gray Lodge Refuge, ~~Butte~~ Sutter Co., Calif.
Nest 23 — 8 eggs; some down, but not much. Nest located in clover at edge of road; cover quite dense + about 30" high. The eggs are laid on the bare ground.
R.H. — 33%
Temp. — 32°C.
Nest 8 — 9 eggs; fairly large amount of down. Nest in clover about 24 inches high; + about 8 feet from a pond.
R.H. — 29%
Temp. — 33°C.
A reading on the ground in the clover was:
R.H. — 30%
Temp. — 29°C.
Air temp., taken within cab of pick-up with both doors open, was 33°C., air rel. humidity — 22%.
Nest 18 (Gadwall nest) — 14 eggs; lots of down, but little cover around the nest. Readings were taken within 30 seconds after ♀ flushed from nest.
R.H. — 20%
Temp. — 32°C.
These readings were taken between 11 A.M. and 12:30 P.M. The day was dry + clear with no wind blowing.

May 23 More readings were taken of duck nests today. The day was warm + clear with no wind blowing. The readings were

Mallard

Mayhew
1952

May 23 Gray Lodge Refuge, Sutter Co., Calif.
taken between 8:15 A.M. & 12 noon. At 8:15 A.M., in open shade, the air temp., 43 inches above the ground (waist high), was 24°C., the relative humidity was 35%.

Nest 11 — The ♀ was gone when I reached the nest, but the eggs were warm. The nest is about 3 feet from water, the cover is about 30 inches high. There are 7 eggs in the nest. Temp. — 32°C., R.H. — 45%.

Nest 23 — The ♀ was flushed from 9 eggs. The nest is about 20 feet from water, in cover about 30 inches high. Temp. — 31°C., R.H. — 45%. Ground temp. (9 A.M.) — 22°C., R.H. — 65%.

Nest 22 — The ♀ was gone when I arrived, & the eggs were cold. This nest is well hidden under a brush pile. The nest contains 8 eggs. Temp. — 19°C., R.H. — 42%.

Nest 24 — A ♀ Gadwall was flushed from 13 eggs in this nest. The cover is about 18 inches high, the nearest water is about 100 yards away. There is lots of down in the nest, but the eggs are resting directly on the ground. Temp. — 34°C., R.H. — 35%. Water about 100 yards away.

Nest 27 — A ♀ was flushed from a nest containing 1 egg. No down was present. 3 ft. from H₂O
The cover, of pigweed & thistle, was about 24 inches high. Temp. — 28°C., R.H. — 45%.

Nest 25 — The ♀ flushed at my approach to the nest, which contained 10 eggs.

Mallard

May 23

Gray Lodge Refuge, Sutter Co., Calif
The cover varied from 18 inches to 6 feet in height, & consisted of mustard, tules, & pigweed. Water was across the road about 50 feet away. There was lots of down in the nest. Temp. — 34°C., R.H. — 43%. (Readings taken at 10 A.M.)

Nest 26 — The ♀ was flushed from a nest containing 5 eggs. There was lots of down in the nest. When the nest was first found, there had been 8 eggs in it, but 3 were now missing. 1 broken shell was found about 2 feet from the nest. Water was about 100 yards away. The cover was about 12 inches high around the nest. Temp. — 34°C., R.H. — 39%.

Nest 8 — The ♀ was flushed upon my arrival at the nest, which contained 9 eggs. There was lots of down in the nest, which was packed around the hygrometer when the readings were taken. Clover cover was about 24 inches high. Water was about 10 feet away. Temp. — 36°C., R.H. — 40%.

Nest 17 — The ♀ flushed at my arrival from 5 eggs. There was lots of down in the nest, which was used to seal in the hygrometer (whenever enough down was present, this was done). Water was about 50 yards away. The cover

Mayhew
1952

Mallard

May 23

Gray Lodge Refuge, Sutter Co., Calif. was about 24 inches high. Temp. — 33.5°C., R.H. — 40%.

Nest 28 — At 11:15 A.M. a ♀ was flushed from a nest about 150 yards east of nest 17 along the edge of the road. There was lots of down present, with 5 eggs. The cover consisted of thistles about 24 inches high. Temp. — 35.5°C., R.H. — 31%.

Nest 19 — ♀ was gone when I arrived. There was lots of down present, along with 7 eggs. Water was about 50 feet away. Cover consisted of foxtails about 26 inches high. Temp. — 36°C., R.H. — 31%.

Nest 13 — ♀ flushed at my arrival. There was lots of down. The foxtail cover was about 18 inches high. Water was about 50 feet away. 9 eggs were in the nest. Temp. — 38°C., R.H. — 34%.

Nest 21 — This nest is about 20 feet from nest 13, so both ♀ flushed at the same time. About 5 minutes elapsed before I could take a reading. No down was present. Cover was the same as for nest 13. 8 eggs were present. Temp. — 34°C., R.H. — 25%.

At 11:45 A.M. readings were taken on the ground + at waist height (43 inches). These were:

	ground	waist high
Temp.	36°C.	35°C.
R. H.	25%	22%

Mayhew
1952

June 6 Gray Lodge Refuge, Sutter Co., Calif.

Today more readings were taken from duck nests on the refuge. The day was 100% overcast with a strong (about 25 m.p.h.) S.E. wind blowing. At 7:35 A.M. the air temp. at waist height (43 inches) was 16°C., relative humidity 71%. On bare ground at that time, the temp. was 17°C., rel. hum. 71%. At 8:45 A.M., in low dense cover, the ground temp. was 18°C., rel. hum. 66%. All readings today were taken between 7:30 + 11:30 A.M. At 11:30, ground temp. was 24°C., rel. hum. 45%; air temp (43") was 21.5°C., rel. hum. 44%.

Nest 18 — (Gadwall) 2 intact eggs + 1 broken egg remained of the clutch. The ♀ was flushed from the nest + remained within 20 feet of the nest the entire time I was there. Cover of wild oats was about 12 inches high, but was very sparse close to the nest. There was lots of down in the nest. (Some heavy paper was fastened around the sides of the hygrometer so that the moisture being measured came directly from the nest.) The nearest water was about 50 yards away. Temp. — 26°C.; R.H. — 83%.

Nest 23 — (Gadwall) The ♀ was flushed from 6 eggs at this nest. There was lots of down present in the nest. The nearest water was about 15 feet away.

Mayhew
1958

Mallard

June 6 Gray Lodge Refuge, Sutter Co., Calif.

Nest 23 (cont.) — Temp. — 30°C.; R.H. — 74% (dropped to 67% & stayed there until temp. reading stabilized).

Nest 11 — The ♀ was flushed from 7 eggs. The nest contains lots of down, & is about 3 feet from water. Temp. — 32°C.; R.H. — 74%.

Nest 32 — The ♀ was absent when I arrived, but the eggs were warm. There was lots of down in the nest, along with 8 eggs. The cover of bull thistles was about 30" high. The nest was about 30 feet from water. Temp. — 28°C.; R.H. — 70%.

Nest 26 — The ♀ was flushed from 4 eggs. There was lots of down in the nest. The nearest water was about 100 yards away. Temp. — 30°C.; R.H. — 70%.

Nest 31 — The ♀ flushed from 6 eggs. There was a fair amount of down present in the nest. The nearest water was about 50 yards away. The cover of bull thistles & pigweed was about 6 inches high. Temp. — 25°C.; R.H. — 75%.

Nest 17 — A ♀ flushed from 5 eggs. There was lots of down present. The nearest water was at least 1/4 mile away (some pools nearby had dried up). Temp. — 35°C.; R.H. — 56%.

Nest 21 — A ♀ was flushed from 7 eggs. There was no down in the nest. The nearest water was about 200 yards away.

Mayhew
1952

June 6 Gray Lodge Refuge, Sutter Co., Calif.
Nest 21 (cont.) — (ponds nearby had dried up). Temp. — 35°C.; R.H. — 50%.
Nest 22 — This nest was deserted. There were 8 eggs present. 3 of these eggs were opened: — 1 showed no development, 2 showed a primitive streak, so that the nest had been deserted very early in incubation.
Nest 29 — This nest was deserted. There were 8 eggs present. 3 of these eggs were opened: — 2 had blood rings & very small embryos, the other showed no development.
Nest 30 — This nest, containing 6 eggs, was deserted. There was 1 very tiny egg present that, on opening, was found to contain no yolk. 2 of the others were opened, but showed little development.
Nest 27 — This nest had been destroyed by some predator, as egg shells remained that were smeared with egg yolk.
Nest 8 — This nest was also deserted, but it was decided to take readings to see how such a nest compared with active nests. There were 7 eggs in the nest. 2 of these were opened, & showed a very early stage of incubation. This nest was about 10 feet from water. Temp. — 23°C., R.H. — 65%.
Nest 28 — This nest was also deserted. It contained 3 eggs, all of which were opened: — 1 early embryo (about 1 week), 2 with no development.

Mayhew
1952

Mallard

(These records were loaned by John Cowan.)

Brood records from Gray Lodge Refuge, Sutter Co., Calif.

Date	♀ present	No. of young	Age of young
April 22	yes	8	downy (1)
" 23	No	9	incomp. feath. (2)
" 24	yes	3	incomp. feath. (2)
May 2	Yes	8	downy (1)
" 2	Yes	8	downy (1)
" 2	yes	10	downy (1)
" 3	yes	12	downy (1)
" 4	yes	6	downy (1)
" 4	yes	9	downy (1)
" 4	yes	7-9 (?)	downy (1)
" 7	yes	7	incomp. feath. (2)
" 12	yes	8	incomp. feath. (2)
" 13	———	7	incomp. feath. (2)
" 13	yes	* 9	downy (1)
" 26	———	6	downy (1)
" 30	yes	4	incomp. feath. (2)
June 1	yes	† 13	downy (1)
" 2	yes	3	downy (1)
" 4	yes	6	comp. feath. (3)
" 5	yes	* 8	incomp. feath. (2)
" 10	yes	* 14	incomp. feath. (2)
" 10	yes	5	comp. feath. (3)
" 10	yes	* 8	downy (1)
" 10	yes	8	downy (1)
" 16	yes	8	incomp. feath. (2)
" 17	2 hens	~26	incomp. feath. (2)
" 19	yes	8	downy (1)
July 2	yes	5	comp. feath. (3)
" 2	2 hens	* 10 of one size, 2 smaller	(2)(3)

* = Cinn. Teal
† = Gadwall

Mayhew
1952

June 6 Gray Lodge Refuge, Sutter Co., Calif.
Nest 19 — This nest had also been destroyed by predators.
Two broods were seen while traveling around the refuge. One
[10] of them had a ♀ + 3 young about 4 weeks old. The other had a ♀
[11] and 7 young about 3 weeks old.

1953 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
May 12 A female with several young were
[1] seen in a ditch about 200 yards away. They were too far away for an accurate count to be made of the brood. When I reached the spot I was able to flush only 2 of the brood + the ♀. The young were about 1 week old. I was never able to find the remainder of the young.

June 4 Most of today was spent looking for mallard broods on the Conaway Ranch. A total of 5 hours was spent in the field (9:30 A.M. to 2:30 P.M.), during which time 32 broods were seen. This is more broods than were seen during the entire seasons of 1949, 1950, + 1952 combined. With the continued rain of April + May this year, this is what was predicted. Apparently the peak of the hatch this year was the last week in ~~Ju~~ May, since all but 2 of the broods were not more than a

Mayhew
1953

Mallard

June 4 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.
week old. Two broods were about 2 weeks old, & one brood was about 6 weeks old. The number of young could not be accurately counted in all cases, but usually a close estimate could be given. However, in 3 cases, not even an estimate was possible. A summary of the results is as follows:

Brood No.	♀ present	No. young	age (weeks)	Where found
1	yes	~6	1	small ditch
2	yes	8	1	small ditch
3	yes	9	1	rice field
4	yes	3	1	small ditch
5	yes	6	1	small ditch
6	yes	9	2	rice field
7	yes	~5	1	rice field
8	no	1	1	rice field
9	no	2	2	small ditch
10	yes	?	1	rice field
11	yes	9	1	small ditch
12	yes	~5	1	small ditch
13	yes	~5	1	small ditch
14	yes	~4	1	small ditch
15	yes	~3	1	main canal
16	yes	?	1	small ditch
17	yes	?	1	small ditch
18	yes	2	1	main canal
19	yes	10	1	small ditch
20	yes	6	1	small ditch
21	no	1	1	small ditch
22	yes	5	1	small ditch

Mayhew
1953

June 4 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif.

Brood No.	♀ present	No. young	age (weeks)	Where found
23	yes	~10	1	rice field
24	yes	~9	1	rice field
25	yes	~7	1	rice field
26	yes	~8	1	rice field
27	yes	11	1	rice field
28	yes	8	1	rice field
29	yes	5	6	main canal
30	yes	1	1	main canal
31	yes	11	1	small ditch
32	yes	6	1	small ditch

The rice is about 6 inches high in the fields that are being used by the mallards. The broods can be seen in the rice checks when one stands on top of the big levee & looks down onto the fields. Otherwise, however, the birds are well hidden. In addition to these broods, the following mallards were also seen: 7 females without drake or brood, 88 drakes by themselves, & 35 pairs of birds. In 4 cases, the young were accompanied by both parents. It appears that there are approximately as many birds present on the ranch as there were in 1950. So far the broods average approximately 6 birds per brood.

June 7 Today was spent looking for more broods. As before, there are quite a few birds still paired. Most of these

Mayhew
1953

June 7 Conaway Ranch, 2 mi. east of Woodland, Yolo Co., Calif. were seen loafing on the rice levees. Most of the broods were well hidden today, apparently, as I found only 5 additional broods.

No.	♀ present	No. young	age (weeks)	Where found
33	yes	10	1	~~rice~~ field
34	Yes	6	1	small ditch
35	yes	~1	1	small ditch
36	yes	5	2	small ditch
37	yes	~1(?)	2	small ditch

Yesterday (June 6) we had .47 inch of rain – the only rain so far this month.

Duck Nests Studied on Gray Lodge Refuge, Sutter Co. Calif., 1952

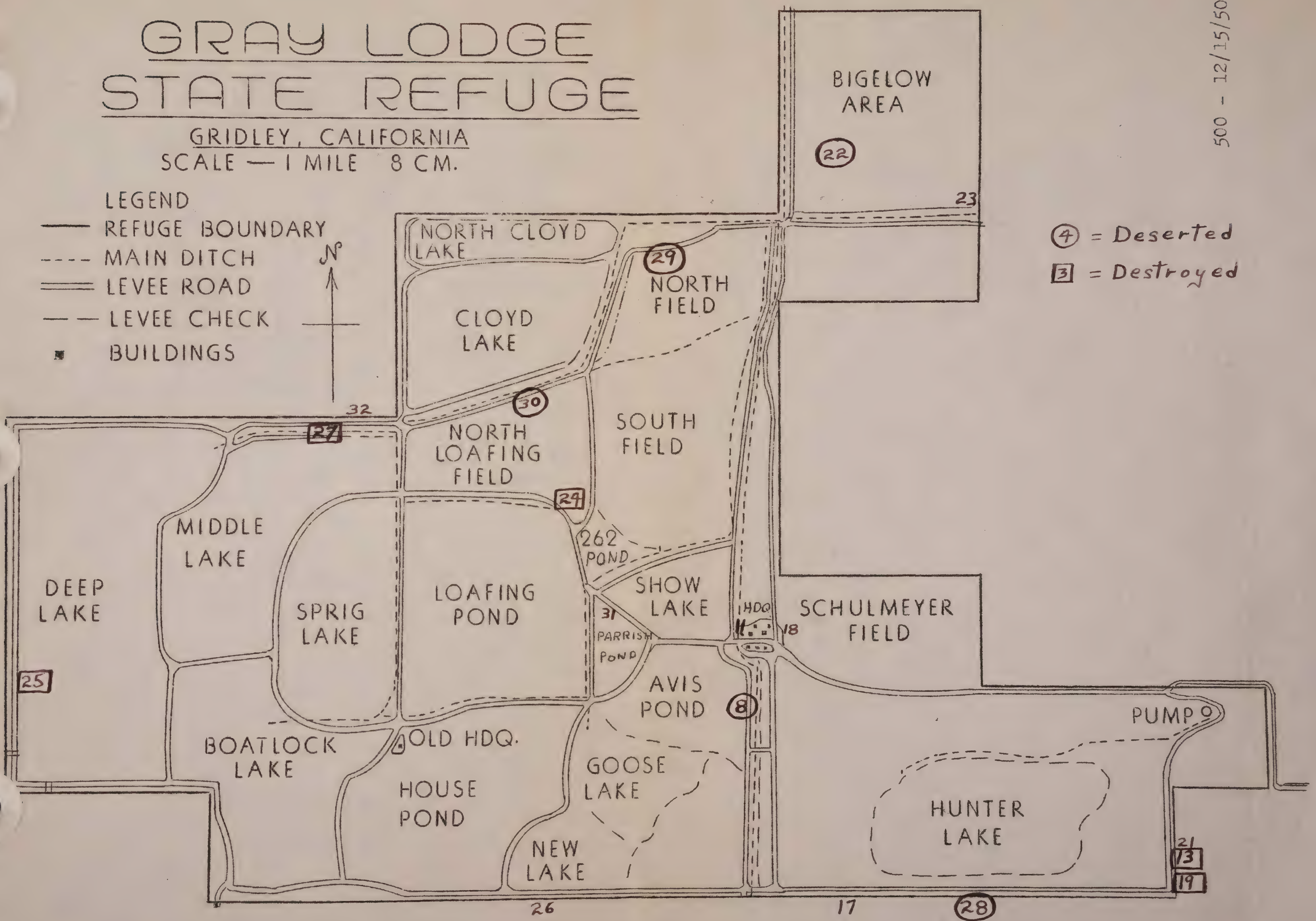
				May 16					May 23					June 6					
Nest No.	No. of eggs	Distance from water (feet)	Height of cover (inches)	Approx. time eggs were exposed (sec.)	Nest temp. °C.	Nest rel. humidity	Ground temp. °C.	Ground rel. humidity	Approx. time eggs were exposed (sec.)	Nest temp. °C.	Nest rel. humidity	Ground temp. °C.	Ground rel. humidity	Approx. time eggs were exposed (sec.)	Nest temp. °C.	Nest rel. humidity	Ground temp. °C.	Ground rel. humidity	Success of nest
8	9	10	24	unknown	33	29	33	22	15	36	40			★	23	65	24	61	Deserted
11	7	3	30	15	33	30			unknown	32	45			15	32	74			Deserted
13	9	50	18	unknown	34.5	26			15	38	34								Destroyed by predator.
17	5	600	30	15	31	28			15	33.5	40			15	35	56			Destroyed by predator.
18*	14	150	12	15	32	20								15	26	83	17	71	Destroyed by predator.
19	7	50	26						unknown	36	31	36	25						Destroyed by predator.
21	8	350	18	15	32	33			300	34	25			15	35	50			All hatched but one.
22	8	100	36	2400	29	31	28	31	unknown	19	42	22	65						Deserted
23*	8	20	30	unknown	32	33			15	31	45			15	30	67			Deserted
24*	13	300	18						15	34	35								Destroyed by predator.
25	10	50	72						15	34	43								Destroyed by predator.
26	5	300	12						15	34	39			15	30	70			At least 3 eggs hatched.
27	1	3	24						15	28	45								Destroyed by predator.
28	5	300	24						15	35.5	31								Deserted
31	6	150	6											15	25	75			Destroyed by predator.
32	8	30	30											unknown	28	70			All hatched
Type of day				clear					Clear					100% overcast					

* = Gadwall nest

All others are Mallard nests

★ = Nest deserted before reading taken

Duck Nests Studied – 1952



Mayhew
1952
Experimental

Mallard

E1

Box 1

Date	Time	Rel. Humidity	Temp. (°C.)
3/16	10:30	64	37.5
3/18	17:10	62	38
3/20	20:00	60	39
3/23	11:50	60	37
3/25	16:55	64	37
3/28	9:35	64	37
3/31	22:45	63	37
4/2	23:50	66	37
4/5	10:15	65	37
4/7	16:40	65	37
4/10	9:00	66	37
4/11	15:30	71	37
4/14	17:00	65	37
4/16	16:20	66	37.5
4/18	15:30	68	37
4/20	17:20	68	38
4/25	9:10	66	38
5/7	12:30	64	37.5
5/14	15:00	65	37.5
5/17	16:15	64	37
5/18	16:15	65	37
5/22	8:50	67	37.5
5/25	11:30	64	37.5
5/27	16:20	63	37.5
5/30	11:15	65	37
6/1	16:30	60	37.5
6/3	16:30	64	37.5
6/5	15:45	65	37.5
6/9	9:30	63	37.5

Mayhew
1952

Experimental

Mallard

E 2

Box 1

Date	Time	Relative Humidity	Temp. (°C.)
6/14	9:15	64	37.5
6/16	15:50	62	37.5

Mayhew
1952

Experimental

Mallard
Box 2

E 3

Date	Time	Rel. Humidity	Temp. (°C.)
3/15	19:40	76	37
3/18	9:10	76	37.5
3/20	13:40	77	37.5
3/22	17:30	77	37
3/25	8:00	77	37
3/27	17:30	77	37
3/31	9:50	75	37
4/2	22:30	78	37
4/4	17:00	78	37
4/7	10:45	77	37
4/9	16:50	76	37
4/11	8:15	76	37
4/14	13:00	77	37
4/16	9:30	75	37
4/18	9:00	76	37
4/20	9:45	75	38
4/22	17:00	75	37
4/24	15:50	77	37.5
5/6	16:45	78	38
5/8	14:00	76	37.5
5/12	14:30	76	37
5/14	8:30	76	37
5/17	13:00	75	37
5/18	8:40	75	37
5/21	17:45	76	37
5/24	19:35	75	37
5/27	7:50	75	37
5/29	13:45	74	37
6/1	9:20	73	37
6/3	12:00	73	37

Mayhew
1952

Mallard

E 4

Box 2

Experimental

Date	Time	Relative Humidity	Temp. (°C)
6/5	8:05	75	36.5
6/8	17:20	78	36
6/10	15:50	75	36
6/13	9:45	76	36
6/16	9:05	78	36.5

Mayhew
1952

Experimental

Mallard

Box 3

E 5

Date	Time	Rel. Humidity	Temp. (°C.)
3/1	17:15	80	37
3/2	16:40	75	36.5
3/3	8:40	83	36.5
3/4	9:50	83	37
3/5	17:30	80	37
3/6	8:00	77	36
3/7	17:15	84	37
3/8	8:00	86	37
3/9	16:50	85	36.5
3/10	8:20	85	36.5
3/11	16:55	85	37.5
3/12	8:20	84	37
3/12	15:30	85	37
3/14	20:00	81	37
~~3/14~~			
3/17	16:45	80	37.5
3/20	8:00	84	37.5
3/22	10:40	84	36.5
3/24	16:30	86	36
3/27	9:50	85	37
3/30	18:30	84	37
4/2	9:00	85	37
4/4	9:00	81	37
4/6	17:40	84	37.5
4/9	9:20	86	37
4/11	18:00	85	37
4/14	9:00	85	37
4/15	17:00	85	37
4/17	17:30	83	37
4/19	17:15	80	37

Mayhew
1952

Expermental

Mallard
Box 3

E 6

Date	Time	Rel. Humidity	Temp. (°C.)
4/22	9:15	82	38
4/24	9:15	84	37
~~5/6~~	~~16:45~~		
5/6	18:30	80	37
5/8	8:50	80	37
5/12	8:45	86	37
5/13	15:45	85	36.5
5/19	8:30	84	36
5/21	7:30	82	36
5/24	11:20	84	36
5/26	16:20	82	36
5/29	8:30	82	36
5/31	17:15	82	36
6/3	8:45	80	36
6/4	16:20	82	36
6/8	10:45	83	36
6/10	15:30	84	36
6/12	16:30	82	36
6/15	16:15	85	37

Mayhew
1952

Mallard

E 7

Box 4

Experimental

Date	Time	Rel. Humidity	Temp. (°C.)
3/15	10:50	88	37
3/17	8:10	85	37
3/19	21:20	89	37
3/21	17:20	88	36
3/24	9:30	90	36
3/26	22:45	90	36
3/29	8:00	90	36
3/30	10:30	90	36
4/1	17:00	88	36
4/3	17:15	87	36
4/6	10:15	87	36
4/8	18:45	88	36
4/11	10:00	89	36
4/13	19:00	88	36
4/15	12:00	88	36
4/17	13:15	88	37
4/19	8:30	90	37
4/21	17:30	89	37
4/23	16:15	91	36
5/7	9:00	90	36
5/7	16:00	93	36
5/8	16:10	88	36
5/11	19:30	90	36
5/13	8:50	90	36
5/15	16:00	90	36
5/18	19:50	91	36
5/20	15:30	90	35
5/23	5:30	90	36
5/24	7:00	90	36
5/26	8:30	88	36

Mayhew
1952

Experimental

Mallard

E 8

Box 4

Date	Time	Relative Humidity	Temp. (°C.)
5/28	16:15	86	36
5/31	9:30	89	36
6/2	16:30	87	36
6/4	14:00	94	36
6/7	8:30	91	35
6/10	9:00	90	36
6/12	8:35	90	36
6/15	9:50	90	35

Mayhew
1952

Experimental

Mallard

E 9

Outer Room

Date	Time	Rel. Humidity	Temp. (°C)
2/29	19:00	40	37.5
3/1	17:15	43	37.5
3/2	9:40	40	37.5
3/3	18:15	40	37
3/4	17:30	40	37
3/5	8:20	37	37
3/6	17:20	38	37.5
3/7	8:30	40	38
3/8	17:15	40	37
3/9	10:50	40	37
3/10	9:10	37	37.5
3/11	16:50	40	37
3/13	9:20	34 *	38
3/13.	16:05	35	38
3/14	8:55	34	38
3/15	19:50	39	38
3/17	9:30	36	38
3/21	9:30	41	37
3/23	22:45	40	37
3/26	8:55	45	37
3/28	17:35	45	37
4/1	11:50	40	38
4/3	12:10	38	37
4/5	18:30	47	37
4/8	9:00	45	37.5
4/10	17:00	45	37
4/13	11:00	41	37
4/15	8:00	40	37
4/17	8:00	40	39

*Door of room opened a good deal this date.

Mayhew
1952

Experimental

Mallard
Outer Room

E 10

Date	Time	Rel. Humidity	Temp. (°C)
4/18	17:30	41	37.5
4/21	8:45	40	38
4/23	9:10	40	37
4/25	15:45	40	38
5/7	12:30	40	37
5/10	18:20	42	37
5/15	8:00	40	37
5/16	7:45	39	37
5/18	6:30	43	37
5/20	7:50	44	37
5/22	16:10	46	37
5/25	18:20	42	37
5/28	8:20	45	37
5/30	18:45	40	37.5
6/2	8:40	36	37.5
6/4	8:15	41	37.5
6/6	5:15	42	37.5
6/6	15:50	40	37.5
6/9	13:15	40	37.5
6/11	15:45	38	37.5
6/14	14:40	40	37

[illegible]

Mayhew
1952
Experimental

Mallard

E 11

Eggs from Gibson Game Farm, Route 2, Box 336, St. Helena, California.

Relative Humidity	No. set (2/29/52)	Candling (3/8/52) Fertile	Doubtful	Infertile	Develop.	Candling (3/21/52) Infertile	Develop. stopped	Condition when stopped
40%	18	5	0	13	3	0	2	(see "condition of broken eggs")
65%	—	—	—	—	—	—	—	—
75%	—	—	—	—	—	—	—	—
85%	18	6	5	7	6	5	0	—
90%	—	—	—	—	—	—	—	—

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open (4/7/52)	condition of broken eggs
40%	0	—	0	14	5	1 very small embryo. 1 partly covered with down. 3 fully devoloped, but lots of yolk to be absorbed.
65%	—	—	—	—	—	—
75%	—	—	—	—	—	—
85%	0	—	0	16	6	6 fully devoloped, but some yolk to be absorbed.
90%	—	—	—	—	—	—

Mayhew
1952
Experimental

Mallard

E 12

Eggs from Gibson Game Farm, Route 2, Box 336, St. Helena, California.

Relative Humidity	No. set (3/14/52)	Candling (3/21/52) Fertile	Doubtful	Infertile	Candling (4/7/52) Develop	Infertile	Develop. stopped	condition when stopped
40%	17	10	3	4	3	3	7	all stages from "heat spots" to formation of down.
65%	12	4	2	6	3	0	3	1 "heat spot" 2 dead embryos.
75%	12	8	2	2	6	2	2	2 dead embryos.
85%	11	7	2	2	7	2	0	———
90%	12	7	3	2	5	2	3	3 dead embryos.

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open (4/27/52)	condition of broken eggs
40%	0	—	0	60	3	3 dead embryos (no weights)
65%	0	—	0	50 ~~33~~	3	57 mm.; 5.3 gms. / 101 " ; 33.3 " / 98 mm.; 28.7 gms.
75%	0	—	0	67	6	74; 12.0 / 82; 15.5 / 91; 25.6 / 69; 10.4 / 105; 29.5 (piped)
85%	0	—	0	63	7	90; 22.8 / 100; 30.3 / 48; 4.2 / 88; 22.1 / 50; 7.2 / 80; 16.6 / 47 mm (partly decomposed)
90%	0	—	0	67	5	102; 26.4 / 95; 40.8 (yolk mass inside body) / 82; 13.7 / 93; 20.0 / 98; 30.5

Mayhew
1952

Mallard

E13

Experimental: Eggs from Russell Thomas, 6030 Blank Road, Sebastopol, California.

Relative Humidity	No. set (3/14/52)	candling (3/21/52) Fertile	Doubtful	Infertile	candling (4/7/52) Develop.	Infertile	Develop. stopped	condition when stopped
40%	30	13	6	11	6	4	9	all stages from "heat spots" to formation of down.
65%	24	15	6	3	13	5	3	3 dead embryos.
75%	24	14	2	8	14	0	2	2 dead embryos.
85%	35	19	7	9	16	6	4	4 dead embryos.
90%	22	11	6	5	7	6	4	4 dead embryos.

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open (4/22/52)	condition of broken eggs
40%	0	—	0	50	6	6 dead embryos (no weights)
65%	0	—	0	66	13	56 mm.; 9.0 gms. 88 " ; 20.2 " 61 " ; 7.2 " | 78 mm.; 12.8 gms. 88 " ; 19.6 " 69 " ; 11.5 " | 62 mm.; 9.0 gms. 68 " ; 10.7 " 80 " ; 15.3 "
75%	0	—	0	66	14	82; 21.0 86; 17.5 73; 16.0 | 45; 5.0 84; 18.6 66; 9.9 | 76; 15.4 74; 13.7 75; 16.1 | 82; 20.3 84; 21.7 80; 17.1 | 67; 9.2 69; 8.3
85%	0	—	0	57	16	78; 15.4 55; 5.3 97; 24.6 | 77; 15.1 84; 17.4 68; 12.1 | 83; 17.7 84; 21.3 87; 24.0 | 83; 25.7 13; — 78; 16.9 | 93; 22.1 44; 5.1 59; 6.2 | 72; 11.3
90%	0	—	0	50	7	58; 7.9 79; 16.4 | 60; 7.5 79; 21.1 | 83; 15.9 68; 10.0 | 75; 14.7

Mayhew
1952

Mallard

E13

Experimental: Eggs from Russell Thomas, 6030 Blank Road, Sebastopol, California.

Relative Humidity	No. set (3/14/52)	candling (3/21/52) Fertile	Doubtful	Infertile	candling (4/7/52) Develop.	Infertile	Develop. stopped	condition when stopped
40%	30	13	6	11	6	4	9	all stages from "heat spots" to formation of down.
65%	24	15	6	3	13	5	3	3 dead embryos.
75%	24	14	2	8	14	0	2	2 dead embryos.
85%	35	19	7	9	16	6	4	4 dead embryos.
90%	22	11	6	5	7	6	4	4 dead embryos.

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open (4/22/52)	condition of broken eggs
40%	0	—	0	50	6	6 dead embryos (no weights)
65%	0	—	0	66	13	56 mm.; 9.0 gms. 88 " ; 20.2 " 61 " ; 7.2 " 78 mm.; 12.8 gms. 88 " ; 19.6 " 69 " ; 11.5 " 62 mm.; 9.0 gms. 68 " ; 10.7 " 80 " ; 15.3 "
75%	0	—	0	66	14	82; 21.0 86; 17.5 73; 16.0 45; 5.0 84; 18.6 66; 9.9 76; 15.4 74; 13.7 75; 16.1 82; 20.3 84; 21.7 80; 17.1 67; 9.2 67; 8.3
85%	0	—	0	57	16	78; 15.4 55; 5.3 97; 24.6 77; 15.1 84; 17.4 68; 12.1 83; 17.7 84; 21.3 87; 24.0 83; 25.7 13; — 78; 16.9 93; 22.1 44; 5.1 59; 6.2 72; 11.3
90%	0	—	0	50	7	58; 7.9 79; 16.4 60; 7.5 79; 21.1 83; 15.9 68; 10.0 75; 14.7

Mayhew
1952

Mallard

E 14

Experimental — Eggs from Gibson Game Farm, Route 2, Box 336, St. Helena, California.

Relative Humidity	No. set (3/29/52)	Candling 4/7/52: Fertile	Candling 4/7/52: Doubtful	Candling 4/7/52: Infertile	Candling (4/21/52): Develop.	Candling (4/21/52): Infertile	Candling (4/21/52): Develop. stopped	Condition when stopped
40%	16	8	7	1	8	1	6	3 vitelline circu., no embryo seen. 2 mm. 3 mm. 2 mm.
65%	26	15	8	3	14	0	9	9 dead embryos (very small)
75%	12	11	1	0	10	0	2	2 dead embryos (very small) ~~1 piped, 105 mm; 29.5 gms.~~
85%	22	18	1	3	16	0	3	3 dead embryo (very small) 1 still alive when egg opened by mistake (4/22/52).
90%	27	14	11	2	12	5	8	3 dead embryos (very small) 2 blood rings — 50 mm; 4 gms. 24 " ; — " 10 " ; — "

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open	Condition of broken eggs
40%	0	—	0	90	11	(see pages E15,16)
65%	0	—	0	90	13	
75%	0	—	0	100	10	
85%	0	—	0	86	17	
90%	0	—	0	74	11	

Mayhew
1952

Mallard

E15

Experimental	R.H.	Gibson eggs set 3/29/52		Dipped
		1. 82 mm. — 22.7 gms.		
		2. 68 " — 11.3 "	(dead before dipped)	o
		3. 97 " — 21.8 "	(?)	o
		4. 63 — 8.6 "		
(embryo size)		5. 99 " — 24.4 "		
	40%	6. 66 " — 11.3 "	(d.b.d.)	x
		7. 75 " — 9.7 "	(d.b.d.)	o
		8. 98 " — 23.5 "	(?)	x
		9. 51 " — 5.9 "	(d.b.d.)	x
		10. 91 " — 21.1 "		
		11. 89 " — 17.5 "		
		1. 102 mm. — 32.8 gms.		
		2. 98 " — 20.9 "	(?)	x
		3. 68 " — 10.0 "	(d.b.d.)	x
		4. 102 " — 28.1 "	(?)	x
		5. 70 " — 11.7 "	(d.b.d.)	o
		6. 65 " — 10.2 "		
	65%	7. 84 " — 19.2 "	(?)	o
		8. 107 " — 28.3 "	(?)	x
		9. 68 " — 8.4 "	(d.b.d.)	o
		10. 70 " — 10.3 "	(d.b.d.)	x
		11. 75 " — 15.2 "	(d.b.d.)	o
		12. 72 " — 11.4 "		
		13. 84 " — 16.3 "	(?)	o
		1. 98 mm. — 27.1 gms.		
		2. 101 " — 27.9 "		
	75%	3. 110 " — 29.9 "		x
		4. 99 " — 27.0 "		o
		5. 94 " — 21.4 "		o

x = dipped 5 times   o = dipped once

Mayhew
1952

Mallard

Experimental	R.H.	Gibson eggs set 3/29/52	Dipped
		6. 78 mm. — 12.1 gms.	o
		7. 93 " — 23.4 "	
	75%	8. 91 " — 22.1 "	
		9. 60 " — 8.1 " (dead before dipping)	x
		10. 100 " — 31.9 "	x
		1. 110 mm. — 31.5 gms. (14 didn't hatch, but had embryos)	
(embryo size)	85%	2. 74 " — 16.3 "	
		3. 91 " — 25.7 "	
		1. 79 mm. — 19.0 gms.	o
		2. 82 " — 16.7 "	
		3. 96 " — 24.6 "	x
		4. 100 " — 27.1 "	x
		5. (Rotten, so embryo wasn't weighed - small)	x
	90%	6. 96 " — 29.2 "	o
		7. 88 " — 20.8 "	
		8. 83 " — 19.9 "	x
		9. 98 " — 29.9 "	o
		10. 100 " — 28.9 "	x
		11. 90 " — 24.1 "	

Mayhew
1952
Experimental

Mallard

Eggs from Russell Thomas, 6030 Blank Road, Sebastopol, California.

Relative Humidity	No. set (3/29/52)	Candling (4/7/52) Fertile	Doubtful	Infertile	Candling (4/21/52) Develop.	Infertile	Develop. stopped	Condition when stopped
40%	14	4	5	5	8	1	3	4 "heat spots"; 45 mm.; 3.5 gms.; 71 " ; 8.9 " ; 52 mm.; 5.2 gms.
65%	16	9	3	4	10	0	2	3 "heat spots"; 45 mm.; 3.9 gms.; 13 " ; —
75%	20	10	6	4	8	2	6	2 dead embryos (very small); 45 mm.; 3 gms.; 15 mm.; —
85%	18	10	5	3	9	0	6	2 "heat spots"; 2 dead embryos (very small); 23 mm. — gms.; 1 mm. — gms.
90%	15	7	6	2	3	1	7	2 "heat spots"; 2 dead embryos (very small); 1 blood ring; 3 mm.; 13 " ; 12 " ; 5 mm.; 15 " ; 15 "

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open	condition of broken eggs
40%	0	—	0	78	8	(See page E18)
65%	1	4/27	8	75	10	
75%	2	4/27	14	70	5	
85%	0	—	0	83	3	
90%	0	—	0	67	3	

Mayhew
1952

Mallard

E 18

Experimental (embryo size)	R.H.	Thomas eggs set 3/29/52		Dipped
	40%	1. 63 mm. — 9.7 gms.		
		2. 75 " — 18.4 "	(dead before dipping)	o
		3. 58 " — 4.4 "		
		4. 63 " — 8.8 "	(d.b.d.)	x
		5. 57 " — 5.4 "	(d.b.d.)	x
		6. 60 " — 7.7 "	(d.b.d.)	x
		7. 82 " — 18.0 "	(d.b.d.)	o
	65%	1. 35 mm. — 3.3 gms.	(d.b.d.)	o
		2. 55 " — 6.6 "	(d.b.d.)	o
		3. 58 " — 8.5 "	(d.b.d.)	x
		4. 44 " — 3.6 "		
		5. 64 " — 11.4 "		
		6. 92 " — 20.0 "	(?)	x
		7. 39 " — 3.6 "	(d.b.d.)	o
		8. 82 " — 15.9 "	~~(d.b.d.)~~	
		9. 81 " — 19.5 "	(?)	o
		10. 79 " — 16.4 "	(d.b.d.)	x
	75%	1. 80 mm. — 20.6 gms.		
		2. 82 " — 15.6 "	(d.b.d.)	x
		3. 79 " — 17.2 "		
		4. 81 " — 16.3 "	(d.b.d.)	x
		5. 92 " — 20.4 "		
	85%	1. 76 mm. — 14.8 gms.		
		2. 90 " — 27.9 "		
		3. 88 " — 28.1 "		
	95%	1. 83 mm. — 20.3 gms.		o
		2. 49 " — 5.1 "		o
		3. 66 " — 18.1 "		o

x = dipped 5 times   o = dipped once

Mayhew
1952

Mallard

Experimental

Eggs from Zack Farmer, 647 G St., Davis, California.

Relative Humidity	No. set (3/29/52)	Candling (4/7/52) Fertile	Doubtful	Infertile	Develop.	Candling (4/21/52) Infertile	Develop. stopped	condition when stopped
40%	—	—	—	—	—	—	—	—
65%	—	—	—	—	—	—	—	—
75%	10	9	—	1	9	—	—	—
85%	—	—	—	—	—	—	—	—
90%	—	—	—	—	—	—	—	—

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open	condition of broken eggs
40%	—	—	—	—	—	—
65%	—	—	—	—	—	—
75%	1	4/27	11	90	8	(See page E20)
85%	—	—	—	—	—	—
90%	—	—	—	—	—	—

Mallard E 20

Mayhew
1952

Experimental	R.H.	Farmer ~~Thomas~~ eggs set 3/23/52	Dipping
		1. 110 mm. — 34.7 gms.	
		2. 106 " — 26.8 "	
		3. 105 " — 30.0 "	
	75%	4. 106 " — 31.2 "	o
		5. 105 " — 32.8 "	o
(embryo size)		6. Rotten, so not weighed (embryo ~60 mm.)	o
		7. 92 " — 21.2 "	o
		8. 90 " — 20.8 "	o

o = dipped once

Mayhew
1952

Mallard

E 27

Experimental

Eggs from Zack Farmer, 647 G. St., Davis, California.

Relative Humidity	No. set (4/8/52)	Candling (4/21/52) Fertile	Doubtful	Infertile	Candling Develop.	Infertile	Develop. stopped	condition when stopped
40%	—	—	—	—	—	—	—	—
65%	7	5	1	1	5	0	1	15 mm.
75%	7	5	0	2	4	0	1	4/23/52 - shell had piece knocked out, but embryo was still alive next day when egg was opened.
85%	—	—	—	—	—	—	—	—
90%	—	—	—	—	—	—	—	—

Relative Humidity	No. Hatched	Date Hatched	% of fertile eggs that hatch	% of fertile eggs	eggs broken open	condition of broken eggs
40%	—	—	—	—	—	—
65%	1	4/29	20	71	—	—
75%	2 1 1	4/29 5/4 5/5	80	71	—	—
85%	—	—	—	—	—	—
90%	—	—	—	—	—	—

Mayhew
1952

Mallard

E 22

Experimental

Chickens

No. Set	No. Hatched	Date Set	Date Hatched	Relative Humidity
8	2	4/8/52	4/29/52	40%
	1	4/8/52	4/30/52	40%
	1 (4)	4/8/52	5/1/52	40%
5	2	4/11/52	5/2/52	40%
5	4	4/11/52	5/2/52	65%
5	4	4/13/52	5/4/52	65%
6	5	4/13/52	5/4/52	75%
6	4	4/15/52	5/6/52	75%
3	1	4/15/52	5/7/52	85%
5	1	4/16/52	5/6/52	40%
4	1	4/16/52	5/7/52	65%

Mayhew
1952

Mallard

E23

Experimental

Egg weights at 40% relative humidity.

Day	Egg #1 (M)	#2 (M)	#3 (M)	#4 (M)	#5 (M)
1	56.7 gms.	63.6 gms.	58.3 gms.	57.5 gms.	66.2 gms.
2					
3	56.4 "	62.6 "	57.7 "	58.7 "	65.3 "
4 *					
5					
6					
7					
8					
9					
10	54.7 "	60.6 "	55.7 "	56.5 "	63.0 "
11					
12					
13 *	53.9 "	59.7 "	54.8 "	55.4 " (infertile)	
14					
15					
16					
17	52.5 "	57.9 "	53.4	—	60.3
18	52.2	57.5	53.0	—	59.8
19 *					
20					
21					
22					
23					
24	49.9 "	54.9 "	50.7 "	—	57.3 "
25 *	49.1 (P) "	54.6 "	50.2 (P) "	—	56.9 (P) "
26			(hatched)		
27	(hatched)	53.4 "			(hatched)
28		(hatched)			

(P) = pipped

* = day dipped (after weighing) (set 5/17)

Mayhew
1952

Experimental

Mallard

E 24

Egg weights at 65 % relative humidity.

Day	Egg # 1 (M)	# 2 (M)	# 3 (M)	# 4 (M)
1	72.8 gms.	57.5 gms.	59.1 gms.	62.5 gm
2	72.5 "	57.3 "	58.9 "	62.2 "
3				
4				
5				
6				
7	71.5 "	56.7 "	57.9 "	61.9 "
8 *				
9				
10				
11				
12				
13	69.8 "	55.5 "	56.7 "	60.7 "
14				
15				
16 *	69.2 "	55.1 "	56.1 "	60.3 "
17				
18				
19				
20	67.8 "	54.2 "	54.9 "	59.6 "
21	67.5 "	53.9 "	54.5 "	59.4 "
22 *				
23				
24				
25				
26				
27 *	65.4 "	52.6 "	52.6 "	——
28				

* = day dipped (after weighing) (set 5/14)

Day	#5	#6
1	67.3 gms.	57.3 gms.
2	67.1 "	57.3 "
3		
4		
5		
6		
7	65.8 "	56.3 "
8 *		
9		
10		
11		
12		
13	64.7 "	55.3 "
14		
15		
16*	63.9 "	54.7 "
17		
18		
19		
20	62.6 "	53.7 "
21	62.3 "	53.4 "
22*		
23		
24		
25		
26		
27*	60.0	51.7
28		

Mayhew
1952

Experimental

Mallard

E 25

Egg weights at 75% relative humidity.

Day	#1 (F)	#2 (F)	#3 (M)	#4 (M)
1	gms.	gms.	gms.	gms.
2				
3 ■	*77.0 "	*71.1 "		
4	76.8 "	70.9 "		
5				
6				
7			*57.0 "	*64.0 "
8			56.8 "	63.8 "
9				
10	75.9 "	70.0 "		
11 ●	*	*		
12				
13				
14			56.0 "	63.1 "
15			*	*
16	74.8 "	69.1 "		
17				
18				
19	*74.1 "	*68.6 "		
20			55.1 "	62.5 "
21				
22				
23	73.0 "	67.7 "	*54.5 "	*62.1 "
24	72.6 "	67.4 "		
25	*	*		
26				
27			53.6 "	61.6 "
28			53.3 "	61.3 "

* = day dipped (after weighing) (F-set 5/11, M-set 5/7)

Mayhew
1952

Mallard

E26

Experimental

Egg weights at 85% relative humidity.

Day	#1 (M)	#2 (M) Egg	#3 (M)	#4 (M)
1	gms.	gms.	gms.	gms.
2				
3				
4				
5				
6				
7*	58.2 "	60.8 "	55.0 "	55.2 "
8	57.9 "	60.7 "	54.7 "	55.0 "
9				
10				
11				
12				
13				
14	57.5 "	60.3 "	54.1 "	54.4 "
15 *				
16				
17				
18				
19				
20	56.7 "	59.7 "	53.7 "	53.7 "
21				
22				
23 *	56.2 "	59.3 "	53.3 "	53.3 "
24				
25				
26				
27	55.5 "	58.6 "	52.7 "	52.5 "
28	55.3 "	58.3 "	52.4 " (pipped)	52.2 "

* = day dipped (after weighing) (set 5/7)

Mayhew
1952

Mallard

E27

Experimental

Egg weights at 90% relative humidity.

Day	Egg #1 (M)	#2 (M)	#3 (M)	#4 (M)	#5 (M)
1	58.6 gms.	60.6 gms.	55.8 gms.	75.0 gms.	64.5 gms.
2					
3					
4	58.2 "	60.2 "	55.8 "	74.7 "	64.3 "
5 *					
6					
7					
8					
9					
10	57.9 "	60.0 "	55.6 "	74.4 "	63.9 "
11					
12					
13 *	57.8 "	59.9 " (infertile)	55.4 "	74.4 "	63.9 "
14					
15					
16					
17	57.3 "	—	55.0 "	74.0 "	—
18	57.3 "	—	55.0 "	73.9 "	—
19 *					
20					
21					
22					
23	(rotten)				
24	—	—	54.8 "	73.6 "	—
25 *	—	—	54.8 "	73.6 "	—
26				(rotten)	
27			54.8 "		
28					

* = day dipped (after weighing) (set 5/17)

Mayhew
1952

Mallard

Experimental Univ. of Calif campus, Davis, Yolo Co., Calif.

Feb. 29 The incubator has been set up to receive the mallard eggs that will be used in the humidity experiments. The incubator is a room 10 ft. X 9½ ft. X 5 ft. that is heated by two electric heaters. In the room have been placed 4 plywood boxes that are 24 in. X 30 in. X 10 in. In each box is a tray with a wire bottom on which the eggs will be placed. Beneath the egg tray ~~will~~ there is a metal tray that will contain the solution that maintains the relative humidity at a constant figure. These metal pans are 10½ in. X 20½ in. X 2½ in. The room has the air circulated by means of a Westinghouse electric fan, style 516860-A, 100/120 volts, which is placed on the top shelf at the back of the incubator. The solutions used to maintain the humidities in the boxes + in the main room, which will also have a series of eggs, are:

Box No.	chemical	*Relative Humidity
main room	$NaCl$	40%
1	$NaCl$	60%
2	KCl	70%
3	K_2SO_4	80%
4	2 pans of H_2O	90%

* This is the humidity before any eggs have been added. The humidity is checked by a Serdex hygrometer, model 201, + the temperature is measured by an HB laboratory Centigrade thermometer

Mayhew
1952

Experimental

March 1 — Today 36 eggs from the Gibson Game Farm were placed in the experimental incubator; 18 eggs at 85%, 18 eggs at 40% relative humidity (box 3 & outer room) (late Feb. 29).

March 8 — Candled the eggs today. The results are on page E 11.

March 14 — Today I set 203 eggs (140 from Thomas, 63 from Gibson).

March 21 — Candled all the eggs today. The results are on pages E 11, 12, 13.

March 29 — Set 196 more eggs today (83 from Thomas, 103 from Gibson, & 10 from Farmer).

40% =	16 Gibson,	14 Thomas		= 30 eggs.
65% =	26 "	, 16 "		= 42 "
75% =	12 "	, 20 "	, 10 Farmer	= 42 "
85% =	22 "	, 18 "		= 40 "
90% =	27 "	, 15 "		= 42 "

March 31 — Today I broke open 2 eggs from the 85% box from the 1st batch (set Mar. 1). One was infertile, the other had an embryo that appeared fully developed, but had not yet absorbed all of the yolk. The eyes were sunken in, so it appeared to have been dead for a while.

April 1 — The electric power was turned off from midnight until 2 A.M. Heat was supplied to the incubator by 5 200 watt bulbs connected to an auxiliary power plant. Only 800 watts were used to keep the temperature up to normal. During the

Mallard

April 1 — entire time the temperature varied only 1°C. The only difference from normal was the lack of the electric fan moving the air around the incubator during the 2 hour lapse of power. However, the temperature within the different humidity boxes didn't change.

April 4 — One chicken hatched this morning at 40% rel. humidity. The egg had gotten in by mistake with some extra small mallard eggs.

April 7 — Today I broke open all the remaining eggs from the original setting of 36 eggs on Feb. 29. The results are tabulated on page E .

April 8 — Today 7 eggs from Farmer were set at 75%, 7 eggs at 65%.

April 12 — Today 102 Gibson eggs were set.

40% — 20 eggs
65% — 20 "
75% — 22 "
85% — 20 "
90% — 20 "

April 14 — Some eggs in the 75% box were seen to be pipped at 17:00 this afternoon.

April 17 — Today at 13:00 I broke open one of the pipped eggs, since mold was forming around the pipped area. The embryo was fully developed, but some of the yolk had not yet been absorbed. Dr. Asmundson of the Poultry Husbandry Dept. looked at it, & said the bird had pipped too early.

Mayhew 1952

Experimental

Mallard

April 17 The bird was dead when I removed it from the shell. The outer membranes had been punctured by the youngster, + none of the membranes had stuck to its body. This egg was from the 75% relative humidity box.

April 19 Today 5 eggs from Farmer were set at 75%, 5 eggs at 85%.

April 21 Today at 8:45 1 egg (Thomas) was seen to be pipped at 40%.

April 22 A series of chicken eggs was set today to check the humidity boxes. These eggs have already been incubated a while, so that they will be expected to hatch at different times. They are in the incubator as follows:

Infertile	Date set	No. of eggs	relative humidity
40% - 3	4/8	8	40%
65% - 3	4/11	5	40%
75% - 2	4/11	5	65%
85% - 0	4/13	5	65%
90% - 1	4/13	6	75%
	4/15	6	75%
	4/15	3	85%
	4/15	3	90%
	4/16	5	40%
	4/16	4	65%
	Total	50	

April 25 Today I divided the eggs of March 29 up into 3 batches: (1) those that would remain untreated (2) those that were dipped in luke-warm water for 3 seconds

Mayhew
1952

Experimental
April 25 and then replaced in their respective boxes (3) those that will be dipped in the same manner, but dipped once a day until they are due to hatch. The eggs were divided as follows:

	Dip every day		Dip once		no dipping	
Rel. Hum.	G	T	G	T	G	T
40%	4	3	4	2	3	3
65%	5	4	6	3	3	3
75%	3	3	4	2	3	3
85%	6	3	6	3	3	3
90%	5	—	4	3	3	—

o on egg = egg dipped once
x on egg = " " every day
All 9 Farmer eggs at 75% were dipped once (those set Mar. 29th).

April 27 At 10:00 3 ducks had hatched at 75%, 1 Farmer egg + 2 Thomas eggs. All these eggs had been dipped once. At 19:00 I found 1 duck (Thomas egg) had hatched at 65%. This egg had not been dipped at all.

April 29 Today 3 Farmer eggs that were set April 8 hatched. Apparently incubation had begun before the eggs were brought in to the incubator. None of these eggs had been dipped at all. One hatched at 65%, two at 75%.

May 3 Today all of Gibson's remaining eggs

Mayhew
1952

Mallard

Experimental

May 3 — (those set April 12th) and all Farmer eggs set April 19th were dipped once.

May 4 — Today one more Farmer egg set April 8th hatched at 75% relative humidity. It had not been dipped.

May 5 — Another undipped Farmer egg that was set April 8th hatched at 75%.

May 7 — Today I set 20 eggs from Victor Morejohn's mallards. 10 were placed at 75% relative humidity + 10 at 85%. These eggs came from 3 hens that were bred by 2 drakes. These eggs had been stored in a refrigerator in the day time + outside at night.

May 8 — Today 18 more Farmer eggs were set — 6 at 90%, 6 at 75%, 6 at 40%.

May 9 — Today Gibson's eggs started to hatch (those that were dipped May 3rd). One hatched at 40% relative humidity first, then 3 hatched at 65% on the same day.

May 10 — Today 4 more hatched at 65% + 6 hatched at 75%.

May 11 — Today 1 hatched at 75% and 2 hatched at 85%. There is one pipped egg at 90% also, in addition to pipped eggs in the other humidities. 4 Farmer eggs set at 75%.

May 12 — Victor Morejohn's records show that his 4 hens (3 since 1st of month) have laid 162 eggs from Feb. 22 to May 7.

Mayhew
1952

Experimental
May 12

Mallard

Readings taken at Gibson Ranch & Thomas Ranch on storing facilities for hatching eggs were as follows (taken 3/29/52):

	Thomas	Gibson
	55% rel. humidity	50% R.H.
	16°C. temp.	16°C. temp.

2 more Gibson eggs hatched at 75% + 2 more at 85% today. Thus, 21 eggs hatched out of 92 fertile ones, for a 23 % hatch. 6 more eggs pipped, but did not hatch:

40% — 0 eggs (On examination, all
65% — 1 " of these eggs showed
75% — 2 " they had pipped too
85% — 2 " early — lots of yolk
90% — 1 " yet to be absorbed.)

The rate of hatching was as follows:

No.	Date Set	Date Hatched	Rel. Humidity
1	4/12/52	5/9/52	40%
3	"	5/9/52	65%
4	"	5/10/52	65%
6	"	5/10/52	75%
1	"	5/11/52	75%
2	"	5/11/52	85%
2	"	5/12/52	75%
2	"	5/12/52	85%

The 6 pipped eggs were broken open + the following was observed:
65% — 1 egg ready to hatch, but it appeared as though the outer membrane had stuck to the duckling's body.

Mayhew
1952

Mallard

Experimental

May 12 75% — 2 eggs pipped, but both appeared to be pipped too early, since the yolk sac had not yet been absorbed in either case.

85% — 2 eggs pipped, but they also appeared to have pipped too early.

95% — 1 egg pipped too early.

May 13 Candled Vic Morejohn's eggs that were set May 7th today. At 75% R.H., all 10 were fertile; at 85% R.H., 9 were fertile + 1 was doubtful (looked like a blood ring). At 40% R.H. 1 F(8) egg broke open, as it was rotten.

May 14 All remaining eggs in the incubator (Farmer (19), (8), (11), + Morejohn (7)) were dipped once this afternoon. 12 May 8's added at 65%.

May 15 ~~4~~ Farmer (19) eggs are pipped at 75% this afternoon. None of this batch has pipped at 85% R.H. yet.

May 16 2 Farmer (19) eggs hatched at 75% today.

May 17 2 Farmer (19) eggs hatched at 75% + 1 F(19) egg hatched at 85% today.

10 more Morejohn eggs + 5 more Farmer eggs were set today — 5 M eggs at 40%, 5 F eggs at 65%, 5 M eggs at 90%.

The eggs that were placed in the 40% + 90% humidities were weighed before being placed in the boxes. Now eggs at all humidities have been weighed.

Mayhew
1952

Mallard

Experimental

May 17 At the present time, the incubator contains the following batches of eggs:

F(3)	M(7)
75% — 5 eggs	75% — 10 eggs
85% — 5 "	85% — 10 "
F(8)	M(14)
40% — 5 eggs	65% — 12 eggs
75% — 6 "	M(17)
90% — 6 "	40% — 5 eggs
F(11)	90% — 5 "
75% — 4 eggs	M(23)
F(17)	65% — 5 eggs
65% — 5 eggs	75% — 5 "

The total numbers in each humidity at present are:

40%	—	10 eggs
65%	—	11 "
75%	—	27 "
85%	—	15 "
90%	—	11 "
Total	—	74 "

May 21 All remaining eggs were dipped once today.

May 24 Another 37 Gibson eggs were set today:— 8 each at 40% + 90%, 7 each at 65, 75 + 85%. Also, 4 more Farmer eggs were set:— 2 at 40% + 2 at 90%.

May 29 All eggs remaining in the incubator were dipped once today. The eggs that are being weighed were weighed ~~yesterday~~ today:

Mayhew
1952

Experimental

May 31

Today 18 more Morejohn eggs were placed in the incubator:— 5 at 40%, 4 at 65%, 5 at 85%, + 4 at 90%. Also, 6 more Farmer eggs were set:— 2 at 65%, 3 at 85%, + 1 at 75%.

Since the eggs have started to be dipped (April 12th eggs), the following number has been incubated:

40%	— 45 eggs	45 eggs	
65%	— 50 "	50	"
75%	— 55 "	55	"
85%	— 50 "	50	"
90%	— 45 "	45	"
Total	245 "	245	"

I finally have all the unhatched eggs broken open + checked. The results on the last group is as follows:

Source	R.H.	Date Set	No. Fertile	No. Infertile
Farmer	75	4/19/52	2	0
Farmer	85	4/19/52	4	0
Gibson	40	4/12/52	17	0
"	65	4/12/52	6	0
"	75	4/12/52	7	1
"	85	4/12/52	8	2
"	90	4/12/52	13	1
Thomas	85	3/29/52	8	0
~~Farmer~~	~~40~~	~~5/8/52~~	~~4~~	~~4~~
~~"~~	~~40~~	~~5/[illegible]/52~~		

Experimental

May 31 All remaining eggs were candled today. The results were as follows:

Source	R.H.	Date Set	no. Fertile	no. Infertile
Farmer	40	5/8/52	~~4~~ 3	2
"	40	5/24/52	2	0
"	65	5/17/52	5	0
"	75	5/8/52	~~4~~ 2	3
"	75	5/11/52	3	1
"	90	5/8/52	5	3
"	90	5/24/52	2	0
Morejohn	40	5/17/52	4	1
"	65	5/14/52	11	1
"	65	5/23/52	5	0
"	75	5/7/52	10	0
"	75	5/23/52	5	0
"	85	5/7/52	9	1
"	90	5/17/52	4	2
Gibson	40	5/24/52	6 (2?)	0
"	65	5/24/52	3 (1?)	3
"	75	5/24/52	2 (5?)	0
"	85	5/24/52	3 †	1
"	90	5/24/52	4	4

† = 3 with blood rings present

June 2 All marked eggs were weighed again today + the data recorded in the weight section of this notebook.

2 F⑧ eggs at 75% are rotten, but 2 F⑧ eggs at 40% have pipped this afternoon.

June 3 All marked eggs were weighed today. 1 F⑧ eggs at 75% was pipped this morning,

Mayhew
1952

Experimental

June 3 — 4 M⑦ eggs at 75% were also pipped, as was 1 M⑦ egg at 85%. At noon, 1 of the F⑧ eggs at 40% had hatched.

June 4 — One more F⑧ egg at 40% hatched this morning. Also 1 F⑧ egg + 2 M⑦ eggs at 75% hatched. 2 F⑧ eggs at 90% contained dead embryos, but the eggs were so rotten they exploded. 4 M⑦ eggs pipped at 85%. One more M⑦ egg hatched at 75% this afternoon. 1 F⑧ + 2 M⑦ eggs are still pipped at 75%. Thus, today 1 hatched at 40%, 4 at 75%.

June 5 — Of the 9 M⑦ eggs left at 85%, 7 were pipped this morning. Still only 1 F⑧ + 1 M⑦ egg pipped at 75%. All remaining eggs were dipped this morning. 2 M⑦ eggs hatched at 85% today.

June 8 — Today 2 F⑪ eggs were pipped at 75%. This afternoon 1 of these eggs hatched.

June 9 — This morning the other F⑪ egg at 75% had hatched. The 11 M⑪ eggs remaining at 65% were dipped today.

June 10 — Eggs that were overdue for hatching were broken open today. The results were:

75%
1. F⑧ – pipped too early.
2. M⑦ – pipped, ready to hatch, but dead.
3. M⑦ – [3] – large embryo, lots of yolk left.
4. M⑦ – " , "
5. M⑦ – " , "
6. M⑦ –

Experimental

June 10

75% (cont.)	7. M⑦ — large embryo — lots of yolk left.
	8. M⑦ — infertile.
	9. F⑪ — [1] — large embryo, lots of yolk left.
85%	1. M⑦ — [1] — pipped too soon.
	2. M⑦ — [2] — "
	3. M⑦ — [4] — "
	4. M⑦ — "
	5. M⑦ — "
	6. M⑦ — large embryo, lots of yolk left.
	7. M⑦ — "
90%	1. F㉔ — very small embryo (1st week)
	2. F㉔ — " "
	3. M⑰ — [1] — " "
	4. M⑰ — [4] — " "

M⑰ at 40% & 90% were pipped today.

June 11 One M⑭ egg at 65% was hatched this morning. 1 F⑰ egg at 65% was pipped. 3 M⑰ eggs at 40% are pipped. 1 M⑰[3] egg at 40% hatched this afternoon. Eggs set 5/31 were candled today. The results were:

40%	M㉛	5 fertile	0 infertile
65%	M㉛	4 "	0 "
	F㉛	0 "	2 "
75%	F㉛	1 "	0 "
85%	M㉛	4 "	1 "
	F㉛	2 "	1 "
90%	M㉛	2 "	2 "

June 12 2 more M⑰ eggs at 40% hatched this morning, [1] + [5]. 1 M⑭[5] egg at 65% also hatched this morning. 2 more are pipped. 4 F⑰ eggs at 65% are pipped.

Mayhew
1952

Mallard

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Experimental

June 12 — M(14) [3] + [6] at 65% were dropped & cracked, but left in the incubator. [3] was already pipped.

June 13 — 1 F(17) egg at 65% was spoiled, so it was broken open. There was a very small embryo inside. An M(17) egg at 90% was also rotting, so it was opened to reveal an embryo about ½ grown. This morning 3 F(17) eggs at 65% were hatched, as was 1 M(17) [2] egg at 40%.

June 14 — One more F(17) egg at 65% hatched today.

June 17 — One F(24) egg at 40% pipped today.

June 18 — Today the only other F(24) egg at 40% pipped. Also 2 M(23) eggs at 65% pipped, as well as 1 G(24) egg at 65%.

June 19 — This morning 2 F(24) eggs at 40% hatched, as did 1 G(24) egg at 65% + 1 M(23) egg at 65%. The results of breaking open all remaining bad eggs was as follows:

40% — G(24) — infertile

65% — M(17) [1] — large embryo — lots of yolk
" [2] — very small embryo
" [3] — pipped too soon
" [4] — large embryo — lots of yolk
" [6] — pipped too soon
" [8] — large embryo — lots of yolk
" [10] — large embryo — lots of yolk
" [11] — very small embryo

90% — M(17) — embryo about 1 week old
3 G(24) — very small embryos

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Experimental

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June 19 — This afternoon 1 M(23) egg at 75% hatched. Another M(23) is pipped at 75%.

June 20 — One M(23) egg at 65% hatched this morning. All unpipped eggs were dipped this morning. Those dipped were:

40% — 5 M(31) eggs ; 6 G(24) eggs
65% — 4 M(31) " ; 4 G(24) "
75% — 1 F(31) " ; 6 G(24) "
85% — 2 F(31) " ; 3 G(24) eggs ; 4 M(31) eggs
90% — 2 M(31) eggs

One G(24) egg at 75% was spoiled (infertile), so it was not dipped.
1 G(24) egg at 40% + 2 M(23) eggs at 75% hatched this afternoon.

June 22 — One G(24) egg hatched at 65% this morning. 1 G(24) egg at 75% + 2 G(24) eggs at 85% are pipped.

June 24 — One G(24) egg at 75% hatched this morning.

June 25 — All remaining (31) eggs were dipped today. Also, 3 eggs from 85% were broken open;
2 G(24) eggs were pipped too soon.
1 F(31) egg was infertile (rotten).

June 26 — Today 4 M(31) eggs at 65% were pipped.

June 27 — Today 3 M(31) eggs at 65% had hatched, the other M(31) egg at 65% was still alive.

June 28 — The last M(31) egg at 65% hatched (of the 4 pipped eggs of 6/26/52).

June 30 — One F(31) egg at 75% + 1 M(31) egg at 85% hatched today.

Mayhew 1952

Mallard

June 30

All the remaining eggs were broken open today. The results were as follows:

40% — 4 G (24) eggs were infertile.
1 G (24) - large embryo / yolk
1 G (24) - small embryo
2 M (31) — small embryo
1 M (31) — medium embryo
2 M (31) — large embryo / yolk

65% — 3 G (24) - infertile
2 M (23) — large embryo / yolk

75% — 4 G (24) — infertile
1 G (24) — large embryo / yolk
2 M (23) — very tiny embryo (stuck)

85% — 1 G (24) — infertile
1 M (31) — large embryo / yolk
2 M (31) — pipped too soon
1 F (31) — pipped too soon

90% — 2 M (31) — very small embryo

A summary of the incubation data for the year is compiled in the following pages. A total summary is present, as well as a summary of the results ~~point~~ of the eggs from the four separate sources. From these summaries, it can be readily seen that under these experimental conditions, dipping the eggs in water is necessary to obtain any hatch at all.

Mayhew
1952

Mallard   E 44

Gibson

Expermental	Date Set	Rel. Hum.	No. set	No. fertile	No. hatched	No. times dipped
	2/29/52	40%	18	5	0	0
	3/14/52	40	17	10	0	0
	3/29/52	40	16	14	0	0
	4/12/52	40	20	19	1	1
	5/24/52	40	8	4	1	1
	3/14/52	65	12	6	0	0
	3/29/52	65	26	23	0	0
	4/12/52	65	20	16	7	1
	5/24/52	65	7	2	1	1
	3/14/52	75	12	8	0	0
	3/29/52	75	12	12	0	0
	4/12/52	75	22	19	9	1
	5/24/52	75	7	2	1	1
	2/29/52	85	18	6	0	0
	3/14/52	85	11	7	0	0
	3/29/52	85	22	19	0	0
	4/12/52	85	20	15	4	1
	5/24/52	85	7	6	0	1
	3/14/52	90	12	8	0	0
	3/29/52	90	27	20	0	0
	4/12/52	90	20	19	0	1
	5/24/52	90	8	6	0	1
Totals			342	246	24	

Mayhew
1952

Mallard

E 45

Thomas

Experimental	Date Set	Rel. Hum.	No. set	No. fertile	No. hatched	No. Times dipped
	3/14/52	40%	30	15	0	0
	3/29/52	40	14	11	0	[redacted] 1
	3/14/52	65	24	16	0	0
	3/29/52	65	16	12	1	0
	3/14/52	75	24	16	0	0
	3/29/52	75	20	14	2	[redacted] 1
	3/14/52	85	35	20	0	0
	3/29/52	85	18	15	0	0
	3/14/52	90	22	11	0	0
	3/29/52	90	15	10	0	[redacted] 1
Totals			218	140	3	

Mayhew
1952

Mallard
Morejohn

E 46

Experimental	Date Set	Rel. Hum.	No. set	No. fertile	No. hatched	No. times dipped
	5/17/52	40%	5	4	4	4
	5/31/52	40	5	5	0	1
	5/14/52	65	12	11	2	4
	5/23/52	65	5	5	2	2
	5/31/52	65	4	4	0	1
	5/7/52	75	10	9	3	3
	5/23/52	75	5	5	3	2
	5/7/52	85	10	9	2	3
	5/31/52	85	5	4	0	1
	5/17/52	90	5	4	0	4
	5/31/52	90	4	2	0	1
Totals			70	62	16	

Mayhew
1952

Mallard — Farmer

E 47

Experimental

Date Set	Rel. Hum.	No. set	No. fertile	No. hatched	No. times dipped
5/8/52	40%	5	4	2	3
5/24/52	40	2	2	2	1
4/8/52	65	7	6	1	0
5/17/52	65	5	5	4	2
5/31/52	65	2	0	0	1
3/29/52	75	10	9	1	0
4/8/52	75	7	5	4	0
4/19/52	75	5	5	4	2
5/8/52	75	6	2	1	3
5/11/52	75	4	3	2	3
5/31/52	75	1	1	0	1
4/19/52	85	5	5	1	2
5/31/52	85	3	2	0	1
5/8/52	90	6	5	0	3
5/24/52	90	2	2	0	1
Totals		70	56	22	

Mayhew
1952

Experimental

Mallard

E 48

Undipped Eggs

Relative Humidity	No. set	No. fertile	No. hatched	% hatched
40%	95	55	0	0
65	85	63	2	3
75	85	64	[redacted] 5	8
85	104	67	0	0
90	76	49	0	0
Totals	445	298	9	—

Dipped Eggs

Relative Humidity	No. set	No. fertile	No. hatched	% hatched
40%	45	40	10	25
65	55	44	16	36
75	60	46	25	54
85	50	41	7	17
90	45	38	0	0
Totals	255	209	58	—

Total Eggs Set

Relative Humidity	No. set	No. fertile	No. hatched	% hatched
40%	140	95	10	10
65	140	107	18	17
75	145	110	30	27
85	154	108	7	6
90	121	87	0	0
Totals	700	507	65	—

Mayhew
1953

Mallard

E 44

Experimental

Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition*
1	65	1	2/26	3/3	—	—	1
2	65	2	2/22	3/3	+	—	1
3	75	1	2/26	3/3	+	(still alive)	1
4	75	2	2/25	3/3	+	—	0
5	75	3	2/23	3/3	—	—	0
6	85	1	2/25	3/3	—	—	1
7	85	2	2/26	3/3	+	3/30	1
8	40	1	2/21	3/3	+	—	1
9	40	2	2/22	3/3	+	3/30	1
10	40	3	3/3	3/3	—	—	2
11	40	4	2/27	3/3	+	3/30	2
12	40	5	3/1	3/3	—	—	2
13	65	3	3/1	3/3	+	3/30	2
14	65	4	2/27	3/3	+	3/30	2
15	65	5	3/1	3/3	+	3/30	2
16	75	4	2/27	3/3	+	—	0
17	75	5	3/2	3/3	+	3/30	2
18	75	6	2/28	3/3	+	3/29	2
19	75	7	3/2	3/3	+	3/30	1
20	85	3	2/28	3/3	+	3/31	2
21	85	4	3/3	3/3	+	3/30	2
22	85	5	2/28	3/3	+	—	2
23	65	6	3/6	3/10	+	—	1
24	65	7	3/8	3/10	+	—	1
25	65	8	3/4	3/10	+	4/6	2
26	65	9	3/8	3/10	+	4/6	2
27	75	8	3/10	3/10	—	—	0
28	75	9	3/6	3/10	—	—	1
29	75	10	3/5	3/10	+	—	1

*0 = no dipping 1 = dip once a week 2 = dip every day

Mallard

E 50

Mayhew
1953

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	30	75	11	3/4	3/10	+	4/6	2
	31	75	12	3/10	3/10	—	—	2
	32	75	13	3/5	3/10	+	—	0
	33	85	6	3/10	3/10	+	(pipped)	1
	34	85	7	3/6	3/10	+	4/6	1
	35	85	8	3/10	3/10	+	(pipped)	2
	36	85	9	3/6	3/10	+	—	2
	37	40	6	3/10	3/10	—	—	1
	38	40	7	3/6	3/10	+	—	1
	39	40	8	3/10	3/10	+	4/4	2
	40	40	9	3/6	3/10	+	4/3	2
	41	40	10	3/11	3/17	+	4/12	1
	42	40	11	3/14	3/17	+	—	1
	43	40	12	3/11	3/17	+	4/11	2
	44	40	13	3/15	3/17	+	4/11	2
	45	65	10	3/12	3/17	+	4/14	1
	46	65	11	3/15	3/17	+	—	1
	47	65	12	3/15	3/17	+	4/14	1
	48	65	13	3/16	3/17	+	4/14	2
	49	75	13	3/17	3/17	+	—	0
	50	75	14	3/13	3/17	+	—	0
	51	75	15	3/11	3/17	+	4/13	1
	52	75	16	3/12	3/17	+	—	1
	53	75	17	3/12	3/17	+	—	1
	54	75	18	3/14	3/17	+	—	1
	55	75	19	3/17	3/17	+	4/13	2
	56	75	20	3/16	3/17	+	4/13	2
	57	75	21	3/16	3/17	+	4/13	2
	58	85	10	3/11	3/17	+	4/13	1
	59	85	11	3/13	3/17	+	—	1

Mayhew
1953

Experimental

Mallard

E 51

Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
60	85	12	3/14	3/17	+	4/13	1
61	85	13	3/8	3/17	+	—	2
62	85	14	3/20	3/23	+	—	1
63	85	15	3/19	3/23	+	—	1
64	85	16	3/23	3/23	+	—	2
65	85	17	3/18	3/23	+	—	2
66	75	22	3/18	3/23	+	—	1
67	75	23	3/22	3/23	+	—	1
68	75	24	3/20	3/23	+	—	0
69	75	25	3/20	3/23	+	—	0
70	75	26	3/18	3/23	+	—	0
71	75	27	3/20	3/23	+	4/20	2
72	75	28	3/20	3/23	+	4/19	2
73	65	14	3/20	3/23	+	4/20	1
74	65	15	3/23	3/23	+	—	1
75	65	16	3/22	3/23	+	4/20	2
76	65	17	3/19	3/23	+	4/21	2
77	40	14	3/19	3/23	+	—	1
78	40	15	3/23	3/23	—	—	1
79	40	16	3/23	3/23	+	—	2
80	40	17	3/22	3/23	+	4/18	2
81	40	18	3/27	3/31	+	—	1
82	40	19	3/31	3/31	+	—	1
83	40	20	3/30	3/31	+	—	1
84	40	21	3/27	3/31	—	—	2
85	40	22	3/27	3/31	+	4/25	2
86	65	18	3/27	3/31	+	4/27	2
87	65	19	3/27	3/31	+	4/27	2
88	65	20	3/27	3/31	+	4/27	2
89	65	21	3/31	3/31	+	4/27	2

Mallard

E 52

Mayhew
1953

Experimental

Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date set	Fertile	Date Hatched	Water Condition
90	65	22	3/27	3/31	+	4/28	2
91	65	23	3/27	3/31	+	—	1
92	65	24	3/29	3/31	+	—	1
93	65	25	3/29	3/31	+	—	1
94	65	26	3/29	3/31	+	4/27	1
95	65	27	3/24	3/31	+	4/27	1
96	75	29	3/24	3/31	+	—	0
97	75	30	3/26	3/31	+	4/27	0
98	75	31	3/25	3/31	+	—	0
99	75	32	3/30	3/31	—	—	1
100	75	33	3/30	3/31	+	—	1
101	75	34	3/30	3/31	+	—	1
102	75	35	3/31	3/31	+	4/26	2
103	75	36	3/30	3/31	+	4/26	2
104	75	37	3/25	3/31	+	4/26	2
105	85	18	3/26	3/31	+	—	1
106	85	19	3/24	3/31	+	—	1
107	85	20	3/25	3/31	+	—	1
108	85	21	3/26	3/31	+	—	2
109	85	22	3/24	3/31	+	—	2
110	85	23	3/25	3/31	+	—	2
111	85	24	4/3	4/7	+	5/4	1
112	85	25	4/3	4/7	+	5/4	1
113	85	26	4/1	4/7	+	5/4	1
114	85	27	4/2	4/7	+	—	2
115	85	28	4/1	4/7	+	—	2
116	85	29	4/4	4/7	+	—	2
117	75	38	4/2	4/7	+	5/4	0
118	75	39	4/2	4/7	+	5/3	1
119	75	40	4/4	4/7	+	5/3	1

Mayhew
1953

Mallard

E 53

Experimental

Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
120	75	41	4/1	4/7	+	5/3	1
121	75	42	4/1	4/7	+	—	2
122	75	43	4/6	4/7	+	—	2
123	75	44	4/5	4/7	+	5/2	2
124	65	28	4/4	4/7	+	—	1
125	65	29	4/3	4/7	+	5/4	1
126	65	30	4/5	4/7	+	5/5	2
127	65	31	4/7	4/7	+	5/5	2
128	65	32	4/5	4/7	+	5/5	2
129	40	23	4/3	4/7	—	—	1
130	40	24	4/7	4/7	+	—	1
131	40	25	4/2	4/7	+	—	1
132	40	26	4/5	4/7	+	5/2	2
133	40	27	4/6	4/7	+	—	2
134	40	28	4/6	4/7	+	5/3	2
135	40	29	4/10	4/14	+ *	—	1
136	40	30	4/12	4/14	+ *	—	1
137	40	31	4/11	4/14	+ *	—	1
138	40	32	4/7	4/14	+ *	—	2
139	40	33	4/11	4/14	+ *	—	2
140	40	34	4/14	4/14	+ *	—	2
141	40	35	4/11	4/14	— *	—	2
142	65	33	4/8	4/14	+	5/11	1
143	65	34	4/13	4/14	+	—	1
144	65	35	4/13	4/14	+	5/11	1
145	65	36	4/13	4/14	—	—	2
146	65	37	4/12	4/14	+	5/11	2
147	65	38	4/10	4/14	+	5/11	2
148	75	45	4/8	4/14	+	5/11	0
149	75	46	4/14	4/14	+	5/10	1

*not counted
(see p. E)

Mallard

E54

Mayhew
1953

Experimental

Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
150	75	47	4/11	4/14	+	—	1
151	75	48	4/14	4/14	+	—	1
152	75	49	4/12	4/14	+	—	2
153	75	50	4/13	4/14	+	5/10	2
154	75	51	4/8	4/14	+	5/10	2
155	85	30	4/9	4/14	+	—	1
156	85	31	4/9	4/14	+	—	1
157	85	32	4/12	4/14	+	—	1
158	85	33	4/10	4/14	+	5/13	2
159	85	34	4/9	4/14	+	5/11	2
160	85	35	4/10	4/14	+	—	2
161	85	36	4/16	4/21	+	5/19	1
162	85	37	4/16	4/21	+	—	1
163	85	38	4/21	4/21	+	—	1
164	85	39	4/15	4/21	+	—	2
165	85	40	4/16	4/21	+	—	2
166	75	52	4/15	4/21	+	—	0
167	75	53	4/18	4/21	+	—	0
168	75	54	4/17	4/21	+	5/19	0
169	75	55	4/17	4/21	+	—	0
170	75	56	4/18	4/21	+	5/18	0
171	75	57	4/15	4/21	+	5/17	1
172	75	58	4/17	4/21	+	—	1
173	75	59	4/15	4/21	+	5/17	1
174	75	60	4/17	4/21	+	5/17	1
175	75	61	4/19	4/21	+	5/17	2
176	75	62	4/19	4/21	+	5/16	2
177	75	63	4/18	4/21	+	—	2
178	65	38	4/21	4/21	+	5/18	1
179	65	39	4/19	4/21	+	5/19	1

Mayhew
1953

Mallard

E.S.S.

Experimental	Egg. No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	180	65	40	4/21	4/21	+	—	1
	181	65	41	4/19	4/21	+	5/18	2
	182	65	42	4/19	4/21	+	5/18	2
	183	65	43	4/19	4/21	+	—	2
	184	40	36	4/19	4/21	+	—*	1
	185	40	37	4/18	4/21	+	—*	1
	186	40	38	4/21	4/21	+	—*	1
	187	40	39	4/21	4/21	+	—*	2
	188	40	40	4/16	4/21	+	—*	2
	189	40	41	4/19	4/21	+	—*	2
	190	40	42	4/23	4/28	+	—*	1
	191	40	43	4/23	4/28	+	—*	1
	192	40	44	4/27	4/28	+	—*	1
	193	40	45	4/28	4/28	+	—*	2
	194	40	46	4/27	4/28	+	—*	2
	195	40	47	4/25	4/28	+	—*	2
	196	65	44	4/24	4/28	—	—	1
	197	65	45	4/23	4/28	+	5/24	1
	198	65	46	4/24	4/28	+	5/25	1
	199	65	47	4/22	4/28	+	5/26	2
	200	65	48	4/22	4/28	+	5/27	2
	201	65	49	4/22	4/28	+	5/26	2
	202	75	64	4/24	4/28	+	5/26	0
	203	75	65	4/26	4/28	+	5/26	0
	204	75	66	4/26	4/28	+	—	0
*not counted	205	75	67	4/25	4/28	+	5/24	1
(see p. E)	206	75	68	4/24	4/28	+	5/24	1
	207	75	69	4/23	4/28	+	—	1
	208	75	70	4/26	4/28	+	—	2
	209	75	71	4/22	4/28	+	—	2

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E56.

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date set	Fertile	Date Hatched	Water Condition
	210	75	72	4/25	4/28	+	—	2
	211	85	41	4/27	4/28	+	—	1
	212	85	42	4/27	4/28	+	—	1
	213	85	43	4/28	4/28	+	—	1
	214	85	44	4/28	4/28	+	—	2
	215	85	45	4/25	4/28	+	—	2
	216	85	46	4/28	4/28	+	5/26	2
	217	85	47	5/2	5/5	+	—	1
	218	85	48	5/3	5/5	+	—	1
	219	85	49	4/30	5/5	+	6/3	2
	220	85	50	5/1	5/5	+	6/3	2
	221	85	51	4/29	5/5	+	—	2
	222	75	73	5/1	5/5	+	6/3	0
	223	75	74	4/29	5/5	—	—	0
	224	75	75	4/30	5/5	+	—	0
	225	75	76	4/29	5/5	+	—	1
	226	75	77	5/5	5/5	+	6/1	1
	227	75	78	5/5	5/5	+	6/1	2
	228	75	79	5/5	5/5	+	—	2
	229	65	50	5/1	5/5	+	6/2	1
	230	65	51	5/2	5/5	+	6/2	1
	231	65	52	4/30	5/5	+	6/2	2
	232	65	53	5/1	5/5	+	6/2	2
	233	65	54	5/4	5/5	+	—	2
	234	40	48	5/2	5/5	+	—	1
	235	40	49	5/2	5/5	+	5/31	1
	236	40	50	5/4	5/5	+	5/31	2
	237	40	51	5/4	5/5	+	5/31	2
	238	40	52	5/3	5/5	+	—	2
	239	40	53	5/11	5/12	+	6/7	1

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Mallard

E57

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date set	Fertile	Date Hatched	Water Condition
	240	40	54	5/10	5/12	+	—	1
	241	40	55	5/12	5/12	+	6/7	2
	242	40	56	5/11	5/12	+	6/6	2
	243	65	55	5/9	5/12	+	6/8	1
	244	65	56	5/10	5/12	+	6/8	1
	245	65	57	5/9	5/12	+	6/7	1
	246	65	58	5/12	5/12	+	6/9	2
	247	65	59	5/11	5/12	+	6/9	2
	248	75	80	5/6	5/12	+	6/9	0
	249	75	81	5/6	5/12	+	6/9	0
	250	75	82	5/8	5/12	+	6/9	1
	251	75	83	5/12	5/12	—	—	1
	252	75	84	5/8	5/12	+	6/8	2
	253	75	85	5/9	5/12	+	6/7	2
	254	85	52	5/6	5/12	+	—	1
	255	85	53	5/7	5/12	+	6/9	1
	256	85	54	5/7	5/12	+	6/10	2
	257	85	55	5/7	5/12	+	—	2
	258	85	56	5/17	5/19	+	6/15	1
	259	85	57	5/14	5/19	+	—	1
	260	85	58	5/14	5/19	+	—	1
	261	85	59	5/13	5/19	+	6/16	2
	262	85	60	5/15	5/19	+	6/16	2
	263	85	61	5/13	5/19	+	—	2
	264	75	86	5/16	5/19	+	6/16	0
	265	75	87	5/14	5/19	+	6/15	1
	266	75	88	5/13	5/19	+	—	1
	267	75	89	5/15	5/19	+	6/15	1
	268	75	90	5/15	5/19	+ (cr.)	—	2
	269	75	91	5/19	5/19	+	6/15	2

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Mallard

E 58

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	270	75	92	5/15	5/19	+	6/15	2
	271	65	60	5/19	5/19	−	—	1
	272	65	61	5/17	5/19	−	—	1
	273	65	62	5/16	5/19	+	—	1
	274	65	63	5/19	5/19	+	6/16	2
	275	65	64	5/17	5/19	+	—	2
	276	65	65	5/14	5/19	+	6/16	2
	277	40	57	5/19	5/19	+	—	1
	278	40	58	5/18	5/19	+	6/14	1
	279	40	59	5/18	5/19	+	6/15	1
	280	40	60	5/16	5/19	+ (cr.)	—	1
	281	40	61	5/17	5/19	+	6/15	2
	282	40	62	5/18	5/19	+	6/15	2
	283	40	63	5/18	5/19	+	—	2
	284	40	64	5/16	5/19	+	6/15	2
	285	40	65	5/23	5/26	+	6/21	1
	286	40	66	5/24	5/26	+	6/21	1
	287	40	67	5/23	5/26	+	6/21	1
	288	40	68	5/24	5/26	+	—	2
	289	40	69	5/25	5/26	+	6/21	2
	290	40	70	5/24	5/26	+	6/21	2
	291	40	71	5/25	5/26	+	6/21	2
	292	65	66	5/21	5/26	+	—	1
	293	65	67	5/20	5/26	+	6/21	1
	294	65	68	5/21	5/26	+	—	1
	295	65	69	5/21	5/26	+	6/23	2
	296	65	70	5/22	5/26	+	—	2
	297	65	71	5/23	5/26	+	6/21	2
	298	75	93	5/20	5/26	+	6/23	0
	299	75	94	5/26	5/26	+ (cr.)	— (Pipped)	0

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Mallard

E59

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Conditions
	300	75	95	5/26	5/26	+	6/21	1
	301	75	96	5/24	5/26	+	6/22	1
	302	75	97	5/22	5/26	+	(pipped)	1
	303	75	98	5/25	5/26	+	—	2
	304	75	99	5/23	5/26	+	—	2
	305	75	100	5/20	5/26	+	—	2
	306	85	62	5/26	5/26	+	—	1
	307	85	63	5/22	5/26	+	6/23	1
	308	85	64	5/25	5/26	+	6/23	1
	309	85	65	5/22	5/26	+	—	2
	310	85	66	5/26	5/26	+	—	2
	311	85	67	5/21	5/26	+	6/24	2
	312	85	68	5/27	6/2	+	6/30	1
	313	85	69	5/27	6/2	+	(pipped)	1
	314	85	70	5/27	6/2	+ (cr.)	6/30	1
	315	85	71	5/28	6/2	+	6/30	2
	316	85	72	5/29	6/2	+	(pipped)	2
	317	85	73	5/29	6/2	+	7/1	2
	318	75	101	5/29	6/2	+	6/30	0
	319	75	102	5/28	6/2	+	6/30	0
	320	75	103	5/30	6/2	+	6/27	1
	321	75	104	5/31	6/2	+	6/28	1
	322	75	105	5/31	6/2	+	6/27	1
	323	75	106	5/31	6/2	+	6/27	2
	324	75	107	5/29	6/2	+	—	2
	325	75	108	6/2	6/2	+	6/29	2
	326	65	72	6/1	6/2	+	6/29	1
	327	65	73	5/31	6/2	+	6/29	1
	328	65	74	6/1	6/2	+	6/28	1
	329	65	75	5/30	6/2	+	6/30	2

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Mallard

E 60

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	330	65	76	6/1	6/2	+	6/29	2
	331	65	77	6/2	6/2	+	6/30	2
	332	40	72	5/30	6/2	+	6/28	1
	333	40	73	5/27	6/2	+	—	1
	334	40	74	5/28	6/2	+	6/27	1
	335	40	75	5/28	6/2	+	6/27	2
	336	40	76	6/2	6/2	+	6/27	2
	337	40	77	6/1	6/2	+	6/28	2
	338	40	78	5/30	6/2	+	6/27	2
	339	40	79	6/9	6/9	+	7/6	1
	340	40	80	6/9	6/9	+	7/6	1
	341	40	81	6/6	6/9	+	7/6	1
	342	40	82	6/4	6/9	+	—	1
	343	40	83	6/8	6/9	+	—	1
	344	40	84	6/7	6/9	+	—	2
	345	40	85	6/7	6/9	+	7/6	2
	346	40	86	6/3	6/9	+	—	2
	347	40	87	6/3	6/9	+	7/6	2
	348	40	88	6/8	6/9	+	—	2
	349	65	78	6/3	6/9	+	—	1
	350	65	79	6/2	6/9	+	7/8	1
	351	65	80	6/9	6/9	—	—	2
	352	65	81	6/4	6/9	+	—	2
	353	75	109	6/5	6/9	—	—	0
	354	75	110	6/6	6/9	+	7/6	0
	355	75	111	6/5	6/9	+	—	0
	356	75	112	6/7	6/9	—	—	1
	357	75	113	6/9	6/9	+	7/7	1
	358	75	114	6/8	6/9	+	7/8	2
	359	75	115	6/8	6/9	+	7/6	2

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Mallard

Experimental	Egg. No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition:
	360	85	74	6/7	6/9	+	— (pipped)	1
	361	85	75	6/4	6/9	+	7/6	1
	362	85	76	6/6	6/9	+	—	2
	363	85	77	6/5	6/9	+	7/8	2
	364	85	78	6/12	6/16	+	—	1
	365	85	79	6/11	6/16	+	— (pipped)	2
	366	75	116	6/12	6/16	+	—	0
	367	75	117	6/11	6/16	+	—	0
	368	75	118	6/13	6/16	— (cr.)	—	0
	369	75	119	6/10	6/16	+	—	0
	370	75	120	6/10	6/16	+	—	0
	371	75	121	6/14	6/16	+	7/13	1
	372	75	122	6/15	6/16	+	—	1
	373	75	123	6/14	6/16	+	—	1
	374	75	124	6/15	6/16	+	7/13	2
	375	65	82	6/13	6/16	+	—	1
	376	65	83	6/12	6/16	+	7/15	1
	377	65	84	6/13	6/16	+	7/14	2
	378	40	89	6/10	6/16	+	7/13	1
	379	40	90	6/16	6/16	+	7/13	1
	380	40	91	6/11	6/16	—	—	1
	381	40	92	6/16	6/16	+	7/13	1
	382	40	93	6/13	6/16	+	7/13	1
	383	40	94	6/12	6/16	+	7/12	1
	384	40	95	6/16	6/16	+	7/12	2
	385	40	96	6/14	6/16	+	—	2
	386	40	97	6/15	6/16	+	7/12	2
	387	40	98	6/15	6/16	+	—	2
	388	40	99	6/10	6/16	+	7/13	2
	389	40	100	6/11	6/16	+	—	2

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Mallard

E62

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	390	40	101	6/18	6/23	—	—	1
	391	40	102	6/19	6/23	+	7/19	1
	392	40	103	6/18	6/23	+	7/19	1
	393	40	104	6/18	6/23	+	7/19	1
	394	40	105	6/19	6/23	+	7/19	1
	395	40	106	6/21	6/23	+	7/19	2
	396	40	107	6/17	6/23	+	—	2
	397	65	85	6/17	6/23	+	7/21	1
	398	65	86	6/23	6/23	+	(pipped)	1
	399	65	87	6/23	6/23	+	7/21	2
	400	65	88	6/19	6/23	+	7/21	2
	401	75	125	6/21	6/23	+	7/21	0
	402	75	126	6/22	6/23	+	—	0
	403	75	127	6/22	6/23	+	7/19	1
	404	75	128	6/18	6/23	+	7/19	1
	405	75	129	6/20	6/23	+	(pipped)	2
	406	85	80	6/22	6/23	—	—	1
	407	85	81	6/21	6/23	+	(pipped)	1
	408	85	82	6/17	6/23	+	7/21	2
	409	85	83	6/17	6/23	+	7/21	2
	410	40	108	6/29	6/30	+	—	1
	411	40	109	6/27	6/30	+	7/26	1
	412	40	110	6/25	6/30	+	7/26	1
	413	40	111	6/29	6/30	—	—	2
	414	40	112	6/28	6/30	+	7/28	2
	415	65	89	6/30	6/30	+	—	1
	416	65	90	6/28	6/30	+	—	1
	417	65	91	6/30	6/30	+	—	2
	418	65	92	6/30	6/30	+	7/27	2
	419	75	130	6/27	6/30	+	7/26	1

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E 63

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	420	75	131	6/29	6/30	+	7/26	1
	421	75	132	6/24	6/30	+	—	1
	422	75	133	6/28	6/30	+	7/27	2
	423	75	134	6/24	6/30	+	7/26	2
	424	75	135	6/25	6/30	+	7/26	2
	425	75	136	6/24	6/30	+	(pipped)	0
	426	75	137	6/26	6/30	+	—	0
	427	75	138	6/25	6/30	+	7/26	0
	428	85	84	6/26	6/30	+	7/27	1
	429	85	85	6/26	6/30	+	(pipped)	1
	430	85	86	6/26	6/30	+	7/26	2
	431	85	87	6/30	6/30	+	—	2
	432	85	88	6/28	6/30	+	(pipped)	2
	433	40	113	7/7	7/7	+	8/2	1
	434	40	114	7/4	7/7	+	—	1
	435	40	115	7/7	7/7	+	8/2	2
	436	40	116	7/4	7/7	—	—	2
	437	40	117	7/1	7/7	+	—	2
	438	65	93	7/6	7/7	+	8/3	1
	439	65	94	7/4	7/7	+	8/4	1
	440	65	95	7/4	7/7	+	(pipped)	2
	441	65	96	7/6	7/7	+	8/3	2
	442	75	139	7/1	7/7	+	8/3	1
	443	75	140	7/2	7/7	+	(pipped)	1
	444	75	141	7/2	7/7	+	8/3	0
	445	75	142	7/1	7/7	+	—	0
	446	75	143	7/6	7/7	+	—	0
	447	75	144	7/5	7/7	+	8/3	2
	448	75	145	7/2	7/7	+	8/3	2
	449	75	146	7/2	7/7	+	8/3	2

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E64

Experimental	Egg No.	Relative Humidity	No. at that R.H.	Date Laid	Date Set	Fertile	Date Hatched	Water Condition
	450	85	89	7/1	7/7	+	8/4	1
	451	85	90	7/3	7/7	+	—	1
	452	85	91	7/5	7/7	+	—	2
	453	85	92	7/5	7/7	+	— (pipped)	2
	454	40	118	7/13	7/14	+	—	1
	455	40	119	7/14	7/14	+	8/10	1
	456	40	120	7/8	7/14	+	8/10	2
	457	40	121	7/9	7/14	+	—	2
	458	65	97	7/8	7/14	—	—	1
	459	65	98	7/14	7/14	+	8/11	2
	460	75	147	7/9	7/14	+	8/10	1
	461	75	148	7/11	7/14	+	8/11	0
	462	75	149	7/11	7/14	+	8/9	2
	463	85	93	7/13	7/14	+	—	1
	464	85	94	7/13	7/14	—	—	2
	465	40	122	7/19	7/21	+	—	1
	466	40	123	7/16	7/21	+ (cr.)	—	2
	467	65	99	7/18	7/21	+	—	1
	468	65	100	7/16	7/21	+	8/17	1
	469	65	101	7/17	7/21	+	—	1
	470	65	102	7/19	7/21	—	—	2
	471	75	150	7/18	7/21	+	—	1
	472	75	151	7/14	7/21	+	—	0
	473	75	152	7/14	7/21	+	—	2
	474	85	95	7/14	7/21	+	8/17	1
	475	85	96	7/17	7/21	+	—	2

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Experimental

March 3 Today 22 eggs, obtained from Mrs. W. W. Wilson, Davis, were set. The humidities being used this year are: 40%, 65%, 75%, + 85%. A series of eggs, to be used as a control, are being set at 75% R.H. without any dipping. In addition, each R.H. has the eggs divided into 2 groups: one group will be dipped in warm water every day, the other group will be dipped once a week. The eggs are picked up once or twice a week from Mrs. Wilson + stored in the departmental refrigerator at 41°F. The eggs are stored in the barn on the Wilson ranch at 52°F.

April 9 Today all unhatched eggs from the March 10 setting were broken open and the contents examined. The results were:

Egg No.	R.H.	Water Condition	Remarks
23	65	1	quite small embryo
24	65	1	almost ready to pip
29	75	1	quite small embryo
33	85	1	pipped (too soon?)
35	85	2	pipped too soon
36	85	2	~ 1/2 developed
38	40	1	almost ready to pip

April 14 Today all unhatched eggs from the March 17 setting were broken open and the contents examined. The results of the examination were:

Mayhew
1953

Mallard

E 66

Experimental

April 14

Egg No.	R.H.	Water Condition	Remarks
42	40	1	almost ready to pip
46	65	1	died during last week
50	75	0	~ 1/2 grown
52	75	1	pipped wrong end, + too soon
54	75	1	~ 3/4 grown
59	85	1	died during last week
61	85	2	quite small

April 21 Today all unhatched eggs from the March 23 setting were broken and examined. The results:

Egg No.	R.H.	Water Condition	Remarks
62	85	1	nearly ready to pip
63	85	1	pipped too soon
64	85	2	pipped too soon
65	85	2	pipped too soon
66	75	1	pipped too soon
67	75	1	pipped too soon
68	75	0	nearly ready to pip
69	75	0	nearly ready to pip
70	75	0	pipped too soon
74	65	1	nearly ready to pip
77	40	1	nearly ready to pip
79	40	2	nearly ready to pip

April 28 Today all unhatched eggs from the March 31 setting were broken + examined. The results were:

Egg No.	R.H.	Water Condition	Remarks
81	40	1	nearly ready to pip
82	40	1	nearly ready to pip
83	40	1	nearly ready to pip
92	65	1	nearly ready to pip
93	65	1	pipped too soon

Mayhew
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Experimental

Mallard

April 28

Egg No.	R.H.	Water Condition	Remarks
96	75	0	soon ready to pip
98	75	0	small embryo
100	75	1	soon ready to pip
101	75	1	pipped too soon
105	85	1	pipped too soon
106	85	1	soon ready to pip
107	85	1	pipped (too soon?)
108	85	2	soon ready to pip
110	85	2	pipped too soon

May 5 Today all unhatched eggs from the April 7 setting were broken & examined. The results were:

Egg No.	R.H.	Water Condition	Remarks
114	85	2	soon ready to pip.
115	85	2	pipped, yolk almost all gone.
116	85	2	pipped, yolk almost all gone.
121	75	2	died during last week.
122	75	2	pipped, yolk almost all gone.
124	65	1	died during last week.
130	40	1	died during last week.
131	40	1	died during last week.
133	40	2	soon ready to pip.

May 11 The thermostat has been acting up since last Friday (May 8). It hasn't been shutting off when it was supposed to, with the result that the temperature in the first box (#1) at 40% relative humidity rose to 41°C. Therefore, all the eggs from April 14 to May 5 at that humidity are probably dead. The temperature rose

Mayhew
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Mallard

E 68

May 11 to 40°C. at 75% R.H. and 85% R.H., so those eggs are also probably dead. However, 75% + 85% eggs hatched during this time, whereas ~~no~~ 40% eggs did, so perhaps some of the eggs survived at the higher humidities.

May 14 Today I broke + examined all unhatched eggs of the April 14 setting. The results were:

Egg. No.	R.H.	Water Condition	Remarks
135	40	1	very small embryo
136	40	1	died during last week
137	40	1	died during last week
138	40	2	died during last week
139	40	2	died during last week
140	40	2	soon ready to pip
143	65	1	pipped too soon
150	75	1	died during last week
151	75	1	nearly ready to pip
152	75	2	pipped (too soon?)
155	85	1	~ 1/2 grown
156	85	1	died during last week
157	85	1	pipped (too soon?)
160	85	2	pipped too soon

May 19 Today I broke open all unhatched eggs of the April 21 setting. The results were:

Egg No.	R.H.	Water Condition	Remarks
162	85	1	pipped too soon
163	85	1	pipped too soon
164	85	2	died during last week
165	85	2	pipped too soon
166	75	0	died during last week
167	75	0	died during last week

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Mallard

E 69

May 19

Egg No.	R.H.	Water Condition	Remarks
169	75	0	died during last week
172	75	1	died during last week
177	75	2	died during last week
180	65	1	died during last week
183	65	2	blood ring when candled.
184	40	1	died during last week
185	40	1	~3/4 grown; large air cell
186	40	1	~ 3/4 grown; large air cell
187	40	2	~ 3/4 grown; large air cell
188	40	2	~ 3/4 grown; large air cell
189	40	2	~3/4 grown; large air cell

All the eggs at 40% died at about the same stage of development, so apparently they were also effected by the extreme temperature ten days ago. Therefore, these eggs will not be counted in the results. All other humidities produced hatches comparable to previous weeks, so these eggs did not receive a lethal dose apparently. Therefore, only the eggs at 40% relative humidity will be discarded from the record.

May 26 Today all unhatched eggs of the April 28 setting were broken and examined. The results:

Egg No.	R.H.	Water Condition	Remarks
190	40	1	died during last week
191	40	1	died during last week
192	40	1	very small embryo
193	40	2	~ 3/4 grown

Mayhew
1953

Mallard

E 70

May 26

Egg No.	R.H.	Water Condition	Remarks
194	40	2	~ 3/4 grown
195	40	2	~ 1/2 grown
204	75	0	~ 1/2 grown
207	75	1	pipped (too soon?)
208	75	2	died during last week
209	75	2	~ 3/4 grown
210	75	2	~ 3/4 grown
211	85	1	pipped too soon
212	85	1	died during last week
213	85	1	died during last week
214	85	2	pipped too soon
215	85	2	pipped (too soon?)

June 5 Today all unhatched eggs of the May 5th setting were broken. The results were:

Egg No.	R.H.	Water Condition	Remarks
217	85	1	pipped too soon
218	85	1	died during last week
221	85	2	pipped too soon
224	75	0	died during last week
225	75	1	died during last week (pipped too soon)
228	75	2	very small embryo
233	65	2	pipped too soon - wrong end
234	40	1	very small embryo
238	40	2	died during last week

Today all the unhatched eggs of the May 12th setting were broken. The results were:

Egg No.	R.H.	Water Condition	Remarks
240	40	1	died during 2nd week
254	85	1	pipped + died
257	85	2	rotten; embryo died early

Mayhew
1953

Mallard

E 71

Experimental
June 18

Today all unhatched eggs of the May 19th setting were broken. The results were:

Egg No.	R.H.	Water Condition	Remarks
259	85	1	died early in 2nd week
260	85	1	died during last week
263	85	2	pipped too soon
266	75	1	very small embryo
268	75	2	(cracked) pipped too soon
273	65	1	died just before pipping
275	65	2	very small embryo
277	40	1	died during 3rd week
280	40	1	(cracked) died during 3rd week
283	40	2	pipped too soon

Mayhew
1953

Experimental

Mallard

E 72

Box 1

Date	Relative Humidity	Temp. (°C.)
3/3	38	36
3/5	48	37
3/6	45	37
3/8	45	37
3/9	45	37
3/11	44	37
3/12 *	45	37.5
3/15	40 (+1 pan)	38
3/16	40	38
3/17	45	38
3/18	50	38
3/19	49 (+2 bowls)	38
3/20	34 (+1 bowl)	38
3/20	34 (+2 bowls)	38
3/20	40 (+1 pan)	38
3/21	37	38
3/22	40	39
3/23	40	38
3/25	45	38
3/29	57	38.5
3/31	45	38
3/31	42	38
4/2	35	38
4/2	45	38.5
4/3	43	39
4/4	44	39
4/5	48	39
4/7	43	39
4/8	42	38.5

* changed from box 4 to box 1.

Mayhew
1953

Mallard

E 73

Box 1

Experimental

Date	Relative Humidity	Temp. (°C.)
4/9	42	39
4/11	51	38.5
4/12	50	38.5
4/13	49	38.5
4/14	47	39
4/15	40	38.5
4/16	40	39
4/18	40	39
4/19	37	39
4/20	51	38.5
4/21	46	39
4/22	42	39
4/24	37	39
4/25	45	39
4/27	42	38.5
4/29	39	39
4/30	39	39
5/1	41	39
5/3	37	39
5/6	38	40
5/7	45	39
5/9	38	41
5/11	38	40
5/14	43	39
5/17	37	38
5/19	43	38
5/21	45	38
5/22	52	38
5/26	42	38
5/27	46	37.5

Mayhew
1953

Mallard

E 74

Box 1

Experimental

Date	Relative Humidity	Temp. (°C.)
5/28	46	37
6/1	46	37
6/7	54	38
6/8	48	38
6/14	45	38
6/15	45	38
6/18	41	37.5

Mayhew
1953

Experimental

Mallard

E 75

Box 2

Date	Relative Humidity	Temp. (°C.)
3/4	70	37.5
3/5	70	38
3/7	71 (+2 bowls)	37.5
3/9	75	37.5
3/10	72	37
3/11	73	38
3/15	72	38
3/16	71	37.5
3/17	70	36.5
3/18	76 (+1 pan)	37
3/19	76	37.5
3/21	75	37
3/23	75	37
3/25	77	37.5
3/28	76	37.5
3/30	76	37
4/1	77	37.5
4/4	77	37.5
4/5	75	37
4/7	77	37
4/9	78	37.5
4/10	77	37.5
4/12	78	38
4/14	78	37
4/16	77	37.5
4/17	76	37.5
4/19	77	38
4/20	78	37.5
4/22	75	37.5
4/23	74	37.5

Mayhew
1953

Mallard

E 76

Box 2

Experimental

Date	Relative Humidity	Temp. (°C.)
4/25	75	38
4/26	75	38
4/27	77	38
4/28	78	37.5
4/30	74	38
5/1	70	38
5/2	75	38
5/4	75	38
5/5	75	38
5/6	76	37
5/7	75	38
5/8	74	38.5
5/11	75	38
5/13	74	38
5/15	76	37.5
5/18	76	37
5/22	73	37
5/23	74	37
5/27	75	37
6/3	75	36
6/5	75	37
6/9	76	36.5
6/16	75	37

Mayhew
1953
Experimental

Mallard
Box 3

E 77

Date	Relative Humidity	Temp. (°C.)
3/3	70	37.5
3/5	73	37.5
3/6	74	37.5
3/7	74 (+1 bowl)	37.5
3/8	77 (+1 pan)	37.5
3/10	77	37.5
3/11	76	37.5
3/12	79	37.5
3/13	77	38
3/16	75	37.5
3/17	84 (+2 pans)	37.5
3/19	81	37
3/21	78	37
3/22	83 (+2 pans +2 bowls)	37
3/23	84	37
3/24	83	37
3/27	83	37.5
3/30	84	37
4/1	85	37
4/3	85	37
4/5	85	38
4/6	85	37
4/7	86	37
4/8	85	37
4/10	85	37
4/11	85	37
4/13	84	37
4/14	85	37
4/15	84	37
4/17	84	37

Mayhew
1953

Experimental

Mallard

E 78

Box 3

Date	Relative Humidity	Temp (°C.)
4/18	83	37
4/20	84	37
4/22	83	37
4/23	84	37
4/24	85	37
4/26	85	37
4/27	84	37
4/28	85	37
4/29	85	37
5/1	85	37
5/2	84	37
5/3	85	37
5/5	85	37
5/5	83	36
5/8	85	37.5
5/11	85	38
5/12	87	36.5
5/13	84	37
5/15	85	37
5/18	84	37
5/19	83	37
5/22	85	37
5/23	84	37
5/26	83	36
5/27	85	36
6/1	87	36.5
6/6	84	37
6/9	85	36.5
6/15	85	37
6/16	87	37

Mayhew
1953

Experimental

Mallard

Box 4

E 79

Date	Relative Humidity	Temp. (°C.)
3/4	48	38
3/6	55 (+1 bowl)	38
3/7	62 (+1 pan)	38
3/9	61	38
3/10	62	38.5
3/12 *	63	38.5
3/13	67	37
3/14	66 (+1 bowl)	37
3/15	66	37
3/17	68	36
3/18	66	37
3/22	68	37
3/23	68	37
3/24	68	37.5
3/26	69	37
3/28	70	37
3/31	70	37
4/1	69	37
4/2	67	37
4/3	67	37.5
4/4	69	37
4/6	70	37
4/8	67	37
4/9	70	37
4/11	67	37
4/13	67	37.5
4/14	68	36.5
4/15	66	37
4/16	69	37

* changed from box 1 to box 4.

Mayhew
1953

Mallard

E 80

Box 4

Experimental

Date	Relative Humidity	Temp. (°C.)
4/18	70	37
4/19	69	37
4/21	68	37.5
4/21	70	37
4/23	68	37.5
4/24	65	37.5
4/25	69	37
4/27	70	37.5
4/28	70	36
4/29	67	37
4/30	69	37
5/2	65	37.5
5/3	65	37.5
5/4	70	37
5/5	71	36
5/6	70	37
5/8	65	37.5
5/9	68	38
5/12	67	37
5/13	65	37
5/15	63	37
5/18	67	37
5/19	64	37
5/21	65	36.5
5/23	66	37
5/26	65	36
5/27	65	37
6/1	63	37.5
6/6	70	37
6/7	65	37

Mayhew
1953

Experimental

Mallard
Box 4

E 81

Date	Relative Humidity	Temp. (°C.)
6/8	67	36
6/17	65	38
6/18	65	38